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SOAP and SANITARY CHEMICALS

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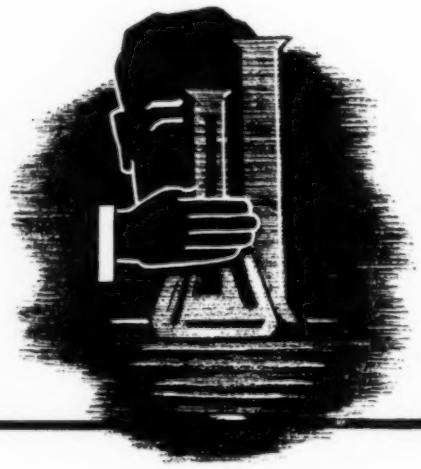

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AS THE EDITOR SEES IT

WITH the resumption of former ceiling prices under a modified OPA, virtual paralysis settled over the soap industry. Unable to purchase tallow and other fats at ceilings, soapers cannot and will not sell soap at ceiling prices. Some soapers had, following the expiration of the original OPA, bought tallow up to 13½ cents, more than four cents over the ceiling. This tallow is now in kettle or in storage, but it will never get to market as soap so long as present soap ceilings apply. Soap sales have ceased until price relief is obtained and soap shipments are just a trickle. Unless relief action is fast, American retail markets will be bare of soap stocks in short order. Some soapers have called in all salesmen from the road, several have shut down completely for a period of a week or two, and others have just flatly withdrawn from the market.

This, in a nutshell, is the position into which passage of the new OPA law by Congress has forced soap manufacturers. Whether relief for soapers is forthcoming in a week or in six months, the country now faces a serious soap famine. Although a minimum of ten per cent increase in ceiling prices is reported needed by the soap industry, most manufacturers to whom we have talked state emphatically that they require fifteen per cent or more in order to operate. Where developments following expiration of the initial OPA law on June 30 indicated that soap production would expand and soon ease shortages in all distributing channels and that price advances would be modest indeed, the new law has cut off sharply this chance to relieve the acute scarcity.

Talk that fats and oils will be decontrolled by early 1947 has been heard in Washington. But of what help will that be to soapers and the country's soap supply if soaps are not likewise decontrolled? And what happens between now and the end of the year? And with the flood of new problems which are bound to descend upon OPA, it would appear that any price relief might be delayed for months.

If the chaos which the resumption of OPA regulations has brought down upon the soap industry is any criterion of its effects elsewhere, the country right now is in a worse economic mess than at any time during the past twenty-five years. The new OPA law is a sorry piece of legislation, a political make-shift adopted to still the clamour of pressure groups in a congressional election year. OPA died and should have been permitted to stay dead. The new legislation puts off again that inevitable day of reckoning with the law of supply and demand, continues to perpetuate a phoney economy, and reinstate the black market. Where in the soap industry an orderly return to normal supply and demand had taken its first steps, this has now been knocked into a cocked hat and replaced by chaos and the likelihood of a real soap famine.

WAR FOOD ORDER 42a which has controlled the use of fats and oils in the manufacture of protective coatings, floor coverings, and other coated fabrics since October 1, 1942 was suspended on July 29 last. No mention, however, has been made of suspending WFO 42b which restricts the use of oils and fats in soap products.

In view of the present situation in oils and fats for soap manufacture, WFO 42b appears to grow less important with each passing day. The question is not one of quota restrictions, but rather where can enough oil or fat be bought to permit oper-

ations at quota maximums. And with the present oil and fat market hog-tied once again by OPA ceilings, WFO 42b at the moment is of little consequence. So whether the Department of Agriculture goes a step further and kills WFO 42b nobody seems to care too much.

SOAP makers have viewed with understandable enthusiasm the steadily advancing rate of copra shipments from the Philippines since the first of the year. When shipments in June reached a total of 48,000 long tons, optimistic predictions began to be voiced that perhaps at last the coconut drought had ended and soap makers could once again count on pre-war quantities of their most acceptable soap-making oil. We hasten to advise that the situation is not yet by any means as optimistic as might be assumed from a simple reading of the June export figures.

In the first place, exports from the Philippines are not arrivals in the U. S., due to a lag of two to three months between shipment of copra and delivery of coconut oil to the soap maker. Then, too, there is no assurance that the high level of June shipments may be expected to continue. In all probability the big June export figures represented, at least in part, a desire on the part of CEMCO to wind up its affairs by shipping out every pound of copra they could get aboard ship before July 1. July and August shipment totals must be awaited before we know whether the big June shipments were just a flash in the pan or rates of shipment which may be expected to continue.

Then, too, there are the demands of other fat and oil consumers for a share of the available coconut oil supply. Considerable pressure is currently being exerted in Washington to divert coconut oil to edible purposes, and twenty-five million pounds have just been granted food producers. Incidentally, this does nothing to add to the supplies of the edible group, we are told, as the coconut oil simply replaces an equivalent quantity of soya bean oil which the edible users were asked to surrender to the paint trade. This latter group, by the way, claims to be in the worst oil supply position of any major oil consuming industry, as the Argentine has disappointed badly on its anticipated shipments of flaxseed and linseed oil.

In the final analysis, even a resumption of pre-war rates of coconut oil shipment is not going to solve the oil and fat shortage for the soap industry in the immediate future. Until world-wide levels of fat production and fat and oil stocks are at normal levels once more, there will be continuing pressure from all fat and oil users to grab off supplies of oils which have always in the past been considered primarily soap making oils.

HEARINGS held four months ago before the Committee on Small Business of the House of Representatives on the distribution of inedible oils and fats by the USDA with the object of investigating the plight of small soapers have just blossomed into recommendations from the Committee. We had despaired of any report after four months, but in the interim had not heard of any bankruptcies or starvation among the smaller soapers.

Briefly the Committee recommends that WFO 42b remain in effect until fat supplies more nearly equal demand, that soapers be given the option of choosing 1940-41 or 1944-45 as the base quota period, that WFO-42b be amended to give all soapers up to 60,000 pounds fat bonus per quarter above quotas, that all exempt uses of fats now be included in use computations, and non-soap uses of inedible fats be restricted on the same basis as fats used in soaps, that WFO-42b be amended to permit coconut oil distribution on a basis of the use of **all** oils and fats during the base period, and that the present policy of USDA in hardship cases be continued.

What will come of these recommendations, which arrived just as we were about to go on the press, we do not know. They will be discussed more in detail next month unless something more exciting happens in the meantime.

Coconut Oil Market Outlook

WHEN 1946 oil and fat estimates were being made up by the U. S. Department of Agriculture earlier this year, department experts counted anxiously, but not too hopefully, on three hundred million pounds of coconut oil from the Philippines to go a long way toward bridging the gap between supply and demand. The feeling was rather general that if the Philippines fell down on their job of getting out the copra, we would be in for a very serious fat and oil shortage, with an accompanying curtailment of soap production, but that if they could export the equivalent of 300,000,000 lbs. of coconut oil, or somewhere near half the pre-war rate, the gap between supply and demand could be narrowed sharply.

When Philippine exports reached 43,900 long tons for the month of June, things began to look definitely more encouraging. Figuring on the basis of 63 per cent oil outturn, this would amount to approximately 56,000,000 lbs. of coconut oil, or at a yearly rate of 670,000,000 lbs.,—practically back to a pre-war basis. The catch is, of course, that in all probability such a rate cannot be expected to continue. The outlook for the second half of 1946 is definitely encouraging, but not quite so encouraging, perhaps, as this high June export figure might make us believe. The current picture, still clouded with uncertainties, would seem to indicate, however, that total 1946 shipments from the Philippines will probably go well above the hoped-for 300,000,000 lbs., and may very well reach 400,000,000 lbs.

As indicated in Table I, copra liftings from the Philippines have shown a gain each month from January to June. In the second quarter of the year, a total of 96,000 long tons of copra were shipped from the Islands.

Table I: 1946 Copra Exports From the Philippine Islands (long tons)

Month	Exported	To Foreign Markets	To U. S.	To U. S. (in terms of lbs. coconut oil)
January	8,300	..	8,300	11,600,000
February	11,800	..	11,800	14,000,000
March	13,300	..	13,000	18,200,000
April	24,000	4,900*	19,000	26,600,000
May	28,000	7,000	21,000	31,000,000
June	43,900	3,980†	40,000	56,000,000
Totals	129,300	15,880	113,100	159,400,000

* To Italy.
† To Denmark.

Table II: Distribution of Coconut Oil for Factory Consumption in the Various Industries* (in approximate thousands of pounds)

Year	To Edible Products	To Soap Products	To Other Products	Yearly Total	Refining Losses Including Oil in Foots
1940	95,000 (18%)	397,000 (75%)	6,000 (1.1%)	528,000	31,000 (5.9%)
1941	106,000 (16.6%)	484,000 (76%)	9,000 (1.4%)	638,000	38,000 (6%)
1942 (Jan.-June)	21,000 (16%)	98,500 (74%)	2,600 (2%)	132,700	10,000 (8%)
					To Fat Splitting and Sulfonation
1942 (July-Dec.)	1,500 (3.2%)	42,000 (88%)	4,000 (8.4%)	48,500	800 (1.7%)
1943	500 (0.3%)	142,000 (74.5%)	1,400 (0.7%)	191,000	46,500 (24.5%)
1944	200 (0.1%)	131,500 (65.7%)	3,400 (1.8%)	199,700	64,500 (32.3%)

* U. S. Dept. Comm. *Animal & Veg. Fats & Oils*, 1940-44.

Of this total, 16,000 long tons of copra, or about twenty-two million pounds of oil were sent to foreign markets. In addition to this, over forty million pounds of oil, equivalent to 29,000 long tons of copra were made available to UNRRA after arrival in the U. S. According to a government spokesmen, this is all that will be allocated to UNRRA for the present.

In the future, it is likely that foreign needs will be supplied largely from British and Dutch sources which have lagged somewhat behind the Philippines in their rehabilitation program, but now are gaining momentum. The Dutch have exported only some 10,000 long tons of copra from the Indies to Holland since the end of the war, it is reported, but they plan to bring copra exports to Europe for 1946 to above 60,000 tons. Some 20,000 tons are now awaiting shipment. It appears then that future copra exports from the Philippines will be reserved principally for U. S. markets.

In analyzing the upward trend in the monthly export figures, one must take into account the fact that "shipments" are not "arrivals," and that a time lag of many weeks may exist between loading of copra and arrival of oil at the soap plant. Therefore the copra export figure for a recent month does not of course represent accurately the amount of coconut oil actually made available on the U. S. market that particular month.

It must also be kept in mind that Philippine copra export figures for May and June may be abnormally high due to the closing out of the activities

of the Copra Export Management Co. with the accompanying desire to round up and expedite the shipment of stock piles accumulated in the past so that records could be closed out in the most favorable light. Reports from the Philippines indicate that every possible pound of copra was loaded for shipment before July 1, and it may well be anticipated that July and August "liftings" will drop well below the surprisingly high June figures.

Factors are now shaping up however, that should in the long run materially boost the production and export of copra to the U. S. There are enough trade goods in the islands now to stimulate copra collection. Roads and trucking facilities have improved. The continuation of the suspension of the two cents per pound processing tax on non-Philippine copra should bring to our markets some copra from the mandated islands and keep the U. S. in a little better bargaining position for the copra from Ceylon and India. However, the return of OPA price controls will interfere seriously with our ability to bid against other buyers in the world copra market.

There are also factors which may retard exports from the Philippines. The principal retarding factor is the lack of inter-island shipping facilities with respect to both vessels and docks. Certain types of Navy craft could be used for inter-island shipping, but it does not seem economically sound to incorporate them into any long-term program without considerable changes in power, and in fuel and hold capacity. In the Islands, there is a lack of skilled labor, materials, and conversion facilities to do much in this direction. It is also difficult to determine what effect the new government with its current internal strife will have on the production and export of copra.

WITH each month showing a substantial gain in the amount of coconut oil available in the U. S. market, the soap industry naturally is anxious to get its share of available oil. The government is portioning coconut oil between the edible and the soap industry, with another claimant being UNRRA, which needs coconut oil for foreign food relief.

Historically, the greatest user of coconut oil has been the soap industry, but the edible industry in the immediate pre-war years took larger quantities of coconut oil than many people realize. Table II shows that in the year just prior to our entry into the war about 18 per cent of the coconut oil was turned over to the production of edible products and 75 per cent went for soap making. By mid 1942, the use of coconut oil for edible products had fallen to only about 3 per cent of available oil whereas the soapers got 88 per cent of the total. Amounts going to other uses rose to 8.4 per cent. At the end of 1943, edible use had become negligible, whereas the soapers were continuing to get their same share of the total allottment, which had dropped by that time to a little over a third of the pre-war tonnage. However, some 25 per cent of the total was being split, fractionated, sulfonated, and otherwise conditioned to provide surface-active agents, fatty acids, and their derivatives for a multitude of new war uses. By the end of 1944, the splitting, fractionating and other like processing of coconut oil had taken almost a third of the total amount allocated and had cut the soap industry's share to about two-thirds, the edible industry getting almost none. It is quite probable however, that a fair share of this specially processed material found its way into various soaps and cleaners.

Coconut Oil and Copra Imports—1935-1945
(in equivalent of pounds of coconut oil)

Year	*Imports (Lbs.)*
1935	639,500,000
1936	551,031,000
1937	676,159,000
1938	687,142,000
1939	606,724,000
1940	758,365,000
1941	764,220,000
1942	132,713,000
1943	192,410,000
1944	171,212,000
1945	183,048,000

All in all, the soap industry has not fared too badly compared with other coconut oil users, and in the months ahead is likely to find an increasing pressure from edible and other users for a larger share of available coconut oil stocks. The food industry was just recently allocated 25 million pounds of coconut oil for the third quarter, but lost an equivalent amount of soybean oil to the paint makers to fill an acute raw material shortage created by a practical cessation of imports from Argentina. War uses for coconut oil fatty acids and their derivatives have stimulated the capacity of the fractionating industry and many of their new products will find permanant peace-time uses other than in soaps, creating another group of users to compete for available coconut oil supplies.

It is hard at this date to determine what the net effect of all these recent developments will be on the soaper's share of available coconut oil. During the temporary demise of the O. P. A. authority, tallow prices went up to 13 cents and higher. With price controls off, coconut oil would eventually have been bid up and greater imports might have been stimulated. With controls back on again, however, our bargaining position on the world market will not be as favorable and relief from this source is now not as likely. With the return of importation to private hands, some misunderstanding exists among the soapers regarding the method of allocation. It is pointed out that soap makers are to get fifty million pounds of oil during the third quarter but the mechanics of the allocation has changed from a lump-sum-at-a-certain-date basis to a from-time-to-time portioning out within quotas of oil as it becomes available. Even though private hands have taken over importation, however, licenses are still required on each shipment, and oil is still subject to allocation by the Department of Agriculture.

As to the future outlook for copra importation, opinions differ. Some look for quite a drop in shipments from the Philippines during July and August at least. Other mar-

(*Turn to Page* 63)

Locomotives Cleaned by Chemical Shower

BY a turn of the valve the Union Pacific Railroad today is able to give its largest locomotive a chemical "shower bath" and to cut to a fraction its former cost of stripping grease, dirt and paint from the company's locomotives.

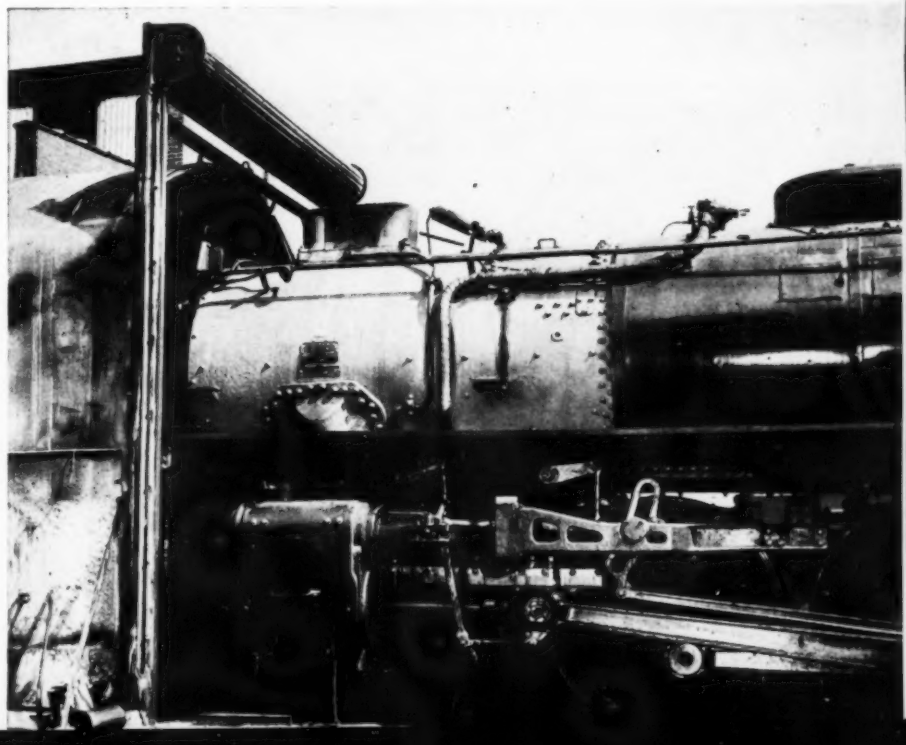
Before the design of the automatic washing and stripping rack at Denver, Colo., by J. R. Frohoff and K. J. Glasmann, U. P. motive power and machinery men, the removing of grease and paint from a locomotive was an expensive operation with a heavy drain on time, money, and manpower. About 192 man-hours were spent in dismantling the locomotive into major component parts for cleaning. The dismantled parts were sprayed with a solution of caustic soda and oil distillate from a hand-carried spray powered by steam pressure, followed by a rinse with a stream of hot water and steam. The dismantled locomotive was then placed in a lye vat for six to eight hours in order to strip the paint from the metal. After rinsing and drying, the engine was ready for repair and repainting.

The housing for the new system is a long narrow metal shed with an internal pipe system interrupted by hundreds of nozzles. A chemical stripping solution is pumped through the pipes and out the nozzles to spray the engine in the shed and remove not only the grease and dirt but also the paint. The shed is 90 feet long and will hold any U. P. locomotive. The cleaning agent is a 4,000 gallon solution of water and caustic soda washing powder stored in a 5,000 gallon subterranean tank adjacent to one side of the building. The mixture is 10 ounces of powder for each gallon of water. The solution is forced through the pipe system at a rate of 2,400 gallons a minute and at a pressure of about 50 pounds by an 80 horsepower, 1,800 RPM centrifugal pump. As the solution pours off the engine, it runs into a drain in the floor and back into the storage tank. The job takes one hour and 20 minutes. The locomotive is then rinsed for about 35 minutes with clear water projected through the pipe system or from a hose.

The grease and paint are removed from the engine drain into the storage tank with the solution, but they are held from being pumped back through the pipe system by a series of stationary screen baffles and a rotating screen baffle. When the operation has been completed, the solution is hoisted by a small 15 horsepower, 400 GPM centrifugal pump into an above-ground temporary storage tank. This permits cleaning of the under-ground tank and baffles. On each stripping job, about 500 gallons of solution are lost through normal attrition, such as that which is left standing on the locomotive.

The new procedure brings the cost of washing and stripping a locomotive from $250 down to $75 and in addition does a much cleaner job in less time. At present, locomotives are passing through the Cheyenne rack at an average of 20 a month.

Water is being pumped through the pipe system of the washing and stripping chamber. The jets of spray are directed at various angles to insure that all surfaces are reached.



Locomotive being pushed into washing and stripping chamber. In approximately two hours all grease and paint will have been removed from the surface of the engine.

SILVER POLISHES

By Milton A. Lesser

A HOUSEWIFE'S pride in her silverware is reflected in its polish. It has been said that the best way to keep silver clean is to use it regularly. However, the truth of the matter is that the finest pieces are usually ornamental, to be taken down and used only on very special occasions. Even the silver that is in daily use is normally given a periodic, extra special polish.

Although other elements may play a part, the presence of hydrogen sulfide is the most important factor in the tarnishing of silver. (1) Present in the atmosphere in most localities, as well as in heating and illuminating gas and various foods (like eggs), hydrogen sulfide reacts with silver and its alloys to form discoloring silver sulfide. The resulting brown film, which so distresses the housewife, calls for the use of polishing materials and methods designed primarily for this purpose.

Because of the nature of the tarnish, and the relative softness of the metal, silver polishes are rather specialized products intended to do a more or less specific job. While they may be used satisfactorily on gold or pewter, because these metals have a similar hardness rating, it is considered poor policy to recommend such a product for use on a variety of metals and other surfaces. The fallacy of making an all-purpose "silver polish" has been stressed on a number of occasions (2, 3) but it is particularly emphasized by the fact that the Government provides separate specifications for silver polishes.

Federal Specification P-P-571b provides standards for the three main types of silver polishes in liquid, paste or powder forms. It does not, however, include the two other types, such as the cake polishes and impregnated cloths. Nor does it include the several simple electrolytic methods for cleaning silver. The Government requirements, applicable to all five types of silver polishes, call for products with good tarnish-removing properties and good luster producing qualities. Such materials must not scratch silver, discolor it, or leave any residue which will cause discoloration, not removable by washing in warm soapy water. They must also be free from acids or cyanides. Pastes and powders should not show caking tendencies and the abrasive matter in liquid polishes should be resuspended readily by shaking.

Undoubtedly the abrasive is the most important material used in silver polishes. It must not be so hard as to scratch silver, yet have sufficient firmness to remove tarnish by its mild abrasive action. Diatomaceous earth is by far the most widely used abrasive in silver polish formulation. Available under such names as diatomaceous earth, infusorial earth, fossil flour, kieselguhr, terra silica and others, federal specifications require that it must be of such particle size that all of it will pass through a No. 200 mesh sieve. Calcium carbonate, in the form of chalk or whiting is often used as an abrasive in silver polishes. Amorphous silica, sometimes used in such products, is a somewhat harsh abrasive for fine silver, but is occasionally employed where a stronger abrasive action is required.

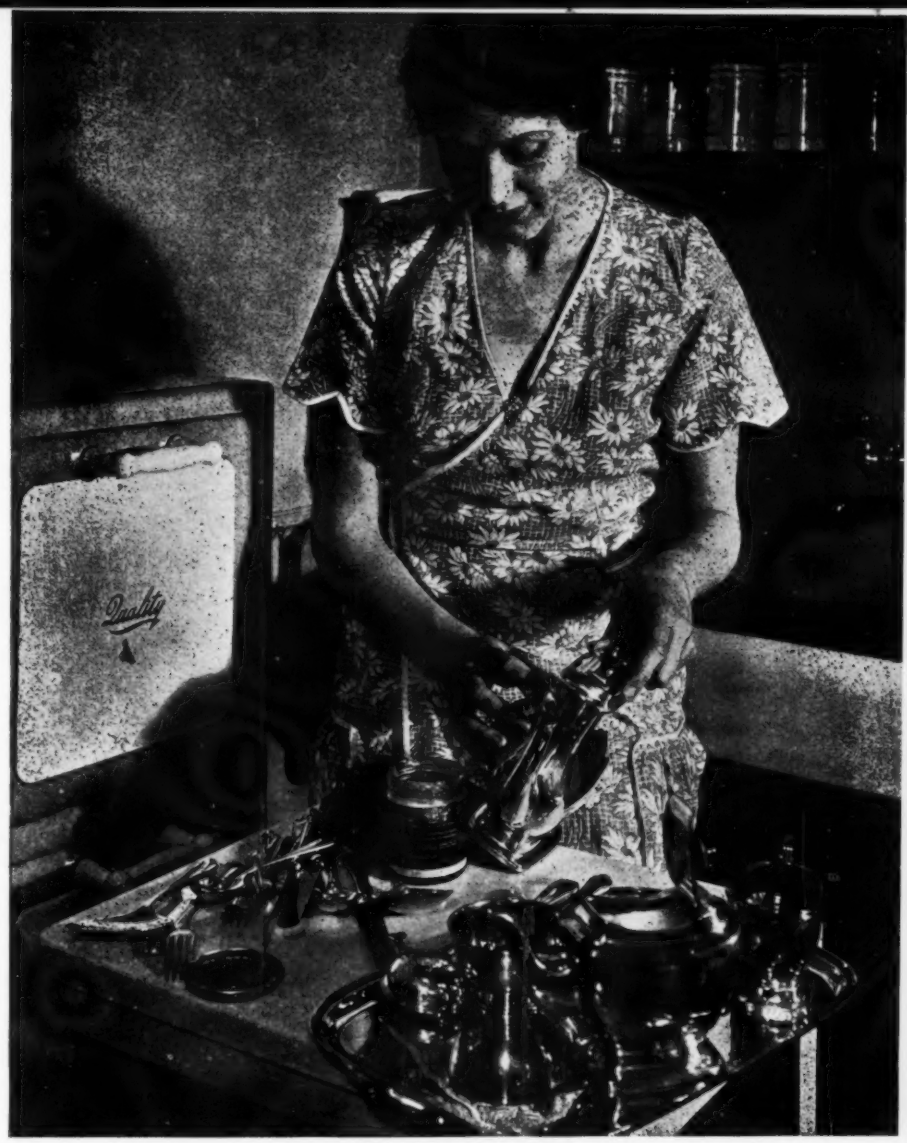
Soap of some kind is usually an important component of silver polishes, where it serves as an emulsifier, detergent, wetting agent, and, to some extent, as a lubricant. In a few instances, synthetic detergents or wetting agents have been included in silver polish formulas. Ammonia, soda ash, trisodium phosphate and other alkalies are frequently included. Glycerine is sometimes present, not only as a wetting agent and lubricant, but also because its hygroscopic action helps to prevent drying and caking of paste products. Mineral oil or other oily materials are sometimes used to impart plasticity and to facilitate polishing through their lubricating action.

Color is optional. Some of the more popular silver polishes are sold in their natural gray color, but other manufacturers prefer to tint their products. Pink is the most popular shade and it is reminiscent of the days when jewelers' rouge was more widely used in making good polishes. Green and yellow are other permitted colors, but they are not employed very extensively. Odor, too, is a matter of preference; sassafrass, wintergreen, pine, cedar wood being among the oils used.

Silver polishes are especially difficult to formulate, and complexity is seldom a mark of superiority. Paste products, among the most popular types of silver polishes, may be prepared from simple combinations of diatomaceous earth, soap and water, with or without the inclusion of small proportions of some alkali. Small (3), for example, cites the fact that four well-known brands contain the same ingredients in the following proportions:

	Per cent
Diatomaceous earth ..	15.0-20.0
Tallow soap	3.0- 8.0
Soda ash	0.5- 1.5
Water	72.0-80.0

In connection with the above, it should be noted that the Federal specifications for paste and liquid polishes requires the amount of volatile matter, at 105° to 106° C, shall



not exceed 70 per cent by weight of the polish.

More in line with this requirement is another formula cited by the same authority:

	Per cent
Diatomaceous earth	30.0
Sodium stearate soap	10.0
Soda ash	0.5
Trisodium phosphate	0.5
Water	59.0

Even patented silver polishes are not especially complex. One such, containing salt as an active ingredient, was described (4) a few years ago as consisting of:

	Per cent
Infusorial earth	20.0
Sodium oleate	20.0
Sodium chloride	5.0-15.0
Water, to make	100.0

A more modern product, said (5) to be an unusually effective polish which works rapidly and efficiently, may be made from:

Fullers earth	3 lb.
Soda ash	1 oz.
Trisodium phosphate	1 oz.
Diglycol stearate	½ lb.
Water	4½ pt.
Lemon odor	½ oz.

Heat the diglycol stearate in the water with stirring until of a smooth creamy consistency. Add the other ingredients and mix completely to form a smooth paste. Pack into jars.

Illustrative of the way in which mineral oil may be used to prevent too rapid drying is the following creamy paste polish described by Belanger: (6)

White soap chips	1 lb.
Fine floated silica	1½ lb.
Light mineral	6 fl. oz.
Water	1 gal.

Melt the soap in the water and add the oil with thorough mixing. When the emulsion begins to thicken, sift in the silica with constant stirring; continuing mixing until sufficiently heavy to prevent the silica from settling out.

On occasion, an organic solvent is included in a polish to help cut or dissolve any greasy films that may have formed on the silver objects. An example of such a product, suitable for packaging in collapsible tubes, may be made from: (7)

	Per cent
Ammonium linoleate	6.0
Benzine	16.0
Water	28.0
Calcium carbonate	40.0
Pigment (e.g. ultramarine)	10.0

Make an emulsion by adding water, with continuous stirring, to the linoleate-benzine mixture and work in the fine powder with thorough mixing.

LIQUID silver polishes also command an excellent market. As a rule, liquid polishes are more efficient where much tarnish is to be removed. (8) Because of the large proportion of abrasives in such items, there is a tendency for the powdered abrasive to settle out of solution. This is not too great a disadvantage provided the material does not pack so hard as to be difficult to resuspend on thorough shaking. To some extent the amount of precipitation will be determined by the efficiency of the dispersing or suspending agent used in the formula. The consistency of liquid polishes may vary quite considerably, ranging from thick creamy products to rather thin fluids.

As indicated in the Federal classifications, a satisfactory silver polish liquid may be prepared by mixing diatomaceous earth, neutral soap and water in suitable proportions. Various forms of calcium carbonate are

also frequently used in such silver polishes. One quite simple product using such an abrasive is made from: (7)

Water	1 qt.
Soap flakes	4 oz.
Whiting	8 oz.
Ammonia	½ oz.

Alcohol is often included in liquid products where it acts as a thinning agent, adjunct solvent and hastens evaporation when the polish is spread on the silver surface. A product of this sort has been described (3) as consisting of a 5 per cent suspension of diatomaceous earth in a 45 to 55 alcohol-water vehicle. Since there is no suspending agent present in this product, it must be shaken before each application. Much more efficient, and said (9) to give excellent results, is a British liquid polish containing:

	Parts
Precipitated chalk	2
Ammonia water	2
Denatured alcohol	3
Water, to make	20

In a number of instances, the soap, which acts as the suspending and dispersing agent, is formed *in situ*. In the following case, ammonium oleate is formed in this manner:

	Per cent
Oleic acid	15.0
Alcohol	58.0
Ammonia (Sp. Gr. 0.910)	7.0
Calcium carbonate precipitated	10.0
Magnesium carbonate	10.0

Add the alcohol to the acid and when homogeneous slowly add the ammonia with agitation. The abrasives are suspended in this vehicle by stirring for a sufficient period.

The same sort of soap-forming reaction takes place in the somewhat more elaborate glycerine-containing polish prepared from:

	Parts
Red oil	4.5
Ammonia (26° Be.)	2.7
Glycerine	5.0
Safrol	0.5
Kieselguhr	12.5
Colloidal kaolin	1.0
Potassium carbonate	0.3
Water	63.5
Red dye	sufficient

The properties of glycerine are quite extensively utilized in the following silver polish, (3) in which zinc oxide probably serves as a whitening pigment rather than as an abrasive:

	Per cent
Fine chalk	15.0
Zinc oxide	2.5
Glycerine	5.0
Water	77.5

Creamy polishes, containing an oily component, enjoy a certain measure of popularity. A liquid polish of this type, with amorphous silica as the abrasive, is said to consist of:

	Per cent
Amorphous silica	25.0
Soda soap	5.0
Pine oil	5.0
Water	65.0

ALUMINUM CLEANERS

The physical and chemical nature of aluminum require that special consideration be given to the selection of materials used for cleaning and polishing aluminum utensils. Hand in hand with increased use of aluminum will go an increased demand for suitable, safe and efficient cleaning materials. An article on this subject by Mr. Lesser in next month's issue of SOAP & SANITARY CHEMICALS.

In view of the fact that silica is a rather hard abrasive for use on silver, (3) it might be well to replace it in the above and following formulas with a more appropriate, softer material:

	Per cent
Amphorous silica	25.0
Ammonium oleate soap	6.0
Ammonia (26° Bt.)	2.5
Mineral oil	0.5
Water	66.0

Various solvents find use in liquid silver polishes, including patented products. 10) A typical product containing such an ingredient is given in Bennett's text as follows:

	Parts
Kaolin	7.5
Kieselguhr	7.5
Ammonia	5.0
Carbon tetrachloride	15.0
Denatured alcohol	60.0
Water	75.0

More specialized, but well worthy of mention is a typical cleansing solution used by jewelers for treating fine silver articles. Such a product can be made along the following lines: (11)

	Parts
Oleic acid	3
Acetone	6
Stronger ammonia water	12
Water	79
Ammonium chloride	15

Dissolve the oleic acid in the ammonia, add a little more than half the water, then the acetone and the rest of the water. Finally dissolve the ammonium chloride in the solution. To use, the articles are first dipped in this cleansing solution, then into benzene or naphtha, after which they are dried, preferably in boxwood saw dust.

SILVER polishing powders, perhaps the easiest of all to prepare, may be used on a damp cloth or made up into a paste with water. Such products may consist of a single material such as diatomaceaus earth, chalk or the like, or a mixture of such mild abrasives with or without added materials. Of decided interest in this connection is the fact that the Federal specification for a silver polish powder calls for a product consisting solely of "finely ground, white, diatomaceous or infusorial earth free from adulterants or foreign matter."

Of course, quite a number of abrasive combinations are possible. One rather elaborate mixture, listed by Prinz (12) as a polish for gold or silver, consists of:

	Parts
Chalk	54
Magnesium carbonate	5
Alumina	14
Silica	8
Iron oxide	5

In many cases, however, the polish powder is prepared from a simple mixture of a mild abrasive and dry, powdered soap. Generally used in a fairly high proportion, the soap provides the requisite detergent and wetting action and greatly facilitates the removal of the tarnish and dirt. One very easily prepared product, yielding a white silver polish powder contains: (7)

	Per cent
Kieselguhr, calcined	80.0
Soap powder	20.0

A simple modification of such a product, mentioned by Tyler, (2) is as follows:

	Per cent
Diatomaceous earth	80.0
Soda tallow soap	19.0
Soda ash	1.0

Several quite different silver polish powders have been described in the older patent literature. (13, 14) By way of illustration there may be cited a composition for detarnishing silver consisting of finely divided zinc, a solid acid like sodium or potassium acid tartrate, and copper oxide. This

provides a potentially reactive dry mixture suitable for use with a damp cloth. (15)

THOUGH quite old fashioned, silver polishes in cake form still find a certain demand. Like powders, they are used by means of a damp cloth rubbed over their surface and in many respects they are similar in composition to polishing powders. Of course such cakes or bars could be prepared by compressing abrasives in suitable molds. More commonly, however, the abrasives are combined with soap. For example a silver soap may be made according to the following formula and method: (9)

	Parts
Coconut oil soap	5
Water	6
Prepared chalk	16

Dissolve the soap in the water with the aid of heat, incorporate the chalk and mold into cakes. The chalk may be substituted by a combination of abrasives to yield a red soap for polishing silver:

	Parts
Prepared chalk	8
White tripoli	3
Jewelers' rouge	3
Red tripoli	2

Another approach to the formulation of a similar polishing soap is given in Bennett's text, as follows:

	Parts
Coconut oil	25
Caustic soda (36° Be.)	12
Precipitated chalk	10

The chalk is first added to the caustic soda solution and this is then saponified with the oil.

SUITABLY impregnated silver polishing cloths also command a quite respectable market. Efficient when new and offering definite convenience, the chief disadvantage of such products is their tendency to become coated with the tarnish they remove, so that they become ineffective after a period of use.

Such polishing cloths are prepared by immersing a suitable cloth, like cotton flannel, in a solvent suspension or mixture of appropriate materials. After impregnation, the solvents are allowed to evaporate or the cloth is passed through rollers and dried. In one method, diatomaceous earth and soap are suspended in kerosene. Cotton flannel is soaked in this preparation and the kerosene is allowed to evaporate off. (2, 3) Soap serves as the suspending agent and bonding penetrant for other combinations, such as the one given (7) in the following method.

	Per cent
Hard soap	10.0
Water	45.0
Oleic acid	6.0
Calcium carbonate	20.0
Red iron oxide	5.0
Ammonia	4.0
Alcohol	10.0

Dissolve the soap in the water with the aid of heat, allow to cool to 60°. and add the oleic acid with stirring, then incorporate the abrasives which should be passed through a fine sieve. When homogeneous, stir in the ammonia and let stand overnight in a covered enamelled kettle. Stir the alcohol into the cold emulsion and strain or mill the entire mixture. Impregnate cotton squares or pads in this bath and let dry.

Another variation employs diglycol stearate as the dispersing agent and includes glycerine to help prevent drying and dusting of the finished product:

	Per cent
Diglycol stearate	15.0
Water	55.0
Glycerine	5.0
Calcium carbonate, precipitated	10.0
Magnesium carbonate	10.0
Paris red	5.0

Dissolve the stearate in the boiling water, and the glycerine and stir in the sieved powdered ingredients. Impregnate cotton pads or squares at 30° to 40° C., press off the excess liquid between rollers, and dry.

Quite different from the foregoing is the following European method (9) for making silver polishing cloth:

	Parts
Beeswax	35
Oleic acid	175
Stearic acid	37
Diatomaceous earth	60

Melt the first three ingredients together and incorporate the previously sieved abrasive. Dip pieces of flannel into the hot mixture and then press through rollers.

FOR many years and with varying degrees of success, people have tried to commercialize the electrolytic method of cleaning silverware. This method depends on the fact that when silver is heated in a solution containing about one-half ounce of sodium bicarbonate and one-half ounce of sodium chloride per quart of water, in contact with certain metal, like aluminum or zinc, the tarnish is removed with practically no loss of silver. In using this process, it is necessary to rinse silverware very thoroughly with hot water after the treatment, otherwise the articles will tarnish more rapidly than usual. Since this method leaves the surface slightly dull, it may be necessary to use a mild abrasive preparation to polish the surface slightly. (8) Special finishes or colored coatings on silver may be marred by such methods. (16)

Sometimes sal soda or trisodium phosphate is used in hot water instead of bicarbonate, in which case it may not be necessary to heat the solution after introducing the silverware. A number of other variations have been suggested in the technical and patent literature. For example, a German process (17) requires that the silver articles be placed in an aluminum vessel containing the following solution:

	Parts
Sodium bicarbonate	9.25
Soap	0.50
Glucose	$.25
Water	1000.00

In an American patent, (18) it is claimed that a mixture of 1-3 diaminopropanol, water and an ammonium salt, produce good cleansing action when the soltuion is heated from 60° to 90° C. in an aluminum vessel containing the silverware being cleaned. A typical formula for this purpose is given as containing:

	Per cent
1-3 diaminopropanol	2.0
Ammonium chloride	0.5
Water	97.5

Other vessels such as glass or enamelware may be used with this solution if a piece of aluminum is allowed to contact the silver articles.

This last recalls that special aluminum or zinc grids have been made available to facilitate silver cleaning by the electrolytic method. Of interest in this connection is a rather novel device for this purpose. According to the patent, (19) a solid material such as calcined soda is wrapped in alumi-

(*Turn to Page* 89)

DURING the past two years, shampoos of the creamy or milky type have been making inroads on the market formerly shared by the liquid and soap-cake types. Manufacturers have used the beauty establishments to pioneer the shampoo markets for these new products, supplying combination wholesale-retail packages containing professional quantities for the operators, together with several four or six ounce jars of the product to be sold to clients. Although the better grades of shaving creams have been used successfully for years as shampoos, the currently popular cream shampoos, marketed as such, are "something new" and that in itself is a selling asset with the ladies, especially when the product appears on the market backed by a reputable name.

Cream shampoos have the same pleasing, creamy or milky appearance that is associated with the finer face creams and lotions and thus are able to cash in on qualities beneficial to the skin that the trade for many years has built up for tissue creams in general. Their popularity is due also to functional reasons for the better ones are good emulsifiers, lathering profusely and rinsing well in hard water. The beauty operators, finding some of the creams easier on their hands and also easy to rinse, have favored them and passed on their recommendations to the customers. Acceptance has been so favorable in many shops that customers willingly accept large charges for cream shampoo treatments. The cream types are popular also with manufacturers because the emulsions, usually of the consistency of thick cream or paste, are relatively stable. They will store longer without breakdown and can be dispensed as a concentrate to be diluted with water just before using.

Shortages in high-sudsing fatty acids and glycerine made it difficult during the war years for suppliers to continue to formulate their products so as to provide for ample detergency and still prevent over-drying of the hair. However, there was an increasing variety of synthetics being developed and available to substitute for high-lathering soaps and glycerine, and their most compatable form of incorporation in shampoos was as a stable creamy emulsion of medium to high viscosity. As a result of these situations, a number of products were rushed to the market to take advantage of the prevailing shortages. Lack of time for careful development in the laboratory was probably responsible for several poor products. Emulsions were unstable. Some products were poor in appearance and even gritty. Formulae were revised as more was learned about cream shampoos, and the field is now more or less stabilized with a smaller number of cream and milky types serving their purpose well.

The cream, or creme type shampoos are essentially emulsions, and their white or creamy opacity is largely due to an intimate dispersion of water and oil rather than to added pigments. Most of the thicker creams or pastes are dispersions of a small amount of water in an oil base of soaps, emulsifying and wetting agents, and other detergent and conditioning aids. In the milky types, it is the organics that are dispersed in a larger amount of water. The products are usually left with their original cream-like color although some of the milky ones are

CREAM SHAMPOOS

By W. J. Beach

tinted. Perfume is used very sparingly; the floral type seems to prevail.

In composition, cream shampoos are formulations of soaps or soapless detergents and synthetic surface-active organics, together with superfatting and hair conditioning agents, all intimately mixed and emulsified with water with or without the use of additional emulsifying. The types are creamy or milky depending on the quantity of added water. Some of the creams are thick pastes and others are thin creams depending on the nature of the ingredients.

The soaps used in cream shampoos are made from various mixtures of lauric, palmitic, and stearic fatty acids, partially or completely saponified by soda, potash, or amine compounds depending on the consistency desired. Various "tailor-made" specialty products such as "Wecolines" and "Neofats" can be substituted for hard-to-get lauric and myristic acids. The fatty acids are compounded with the saponifiers usually with a minimum of heating except where stearic acid is an ingredient. Carbonates, bicarbonates, and other sodium and potassium compounds of low alkalinity are used as saponifiers, as are higher molecular weight amines. The amine soaps of stearic acid are stable and white, but gradually turn tan over a number of months. They are excellent emulsifiers and act to lower the alkalinity of any soda or potash soaps that might be in the formula.

Mono- and triethanolamines are the most commonly used amines, the triethanolamine being sometimes replaced in part with isopropanolamine to produce greater color stability. Only free fatty acids can be saponified by these amines, as they do not react well under normal conditions with the unhydrolyzed glyceride types of fats. When saponifying completely to form a neutral soap, it is best to balance the amine requirement so as not to have an excess. This is conveniently accomplished by determining the total alkalinity of the amine and acidity of the fatty acid mix just before compounding. Some suppliers formerly using ammoniacal compounds in their formulae are changing to other types because of difficulty encountered with hard-to-mask ammonia odors.

THE incorporation of synthetic, organic, surface-active compounds improves detergency, lathering, and rinseability in hard water. They also aid in the compounding of the various constituents,—giving smooth, pearly creams the consistency of which can be controlled by the amount and types of synthetics blended into the formulae. Surface active agents of the anionic type, such as sulfonated and sulfated higher alcohols, are found in numerous cream shampoos, although some manufacturers have found that the non-ionic type serve to enhance stability especially in the products of higher real soap content. Non-ionic detergents are those such as Atlas Powder's oil-in-water types, "Tween," and "Span," or water-in-oil type, "Arlacel"; or the polyethylene glycol type such as Carbide and Carbon's, "Carbitol" and "Carbowax." Cream shampoos on the "acid side" may be emulsified by emulsifiers presenting an active cation rather than an anion as do most soaps, for these compounds are not precipitated as readily by acids or by the calcium of hard water. Cetyl pyridinium sulfate is a typical example in which the cetyl pyridinium cation is active.

A number of other adjuncts are included for special purposes in the formulation of cream shampoos. Lanolin is used up to about five per cent as a superfatting agent. About one per cent of terpineol added to the lanolin prior to compounding will mask any slightly rancid odor that may develop

The cream shampoos shown above typify some of the better products currently found on the market. They are of the heavy cream type. No cream shampoos of the milky type were found in a recent check of over-the-counter sales in the New York market, although available to beauty shop clients.

on long-standing. Lanolin may cause some discoloration. Some creams are color-stabilized by the use of about one oz. of sodium bisulfite per 100 lbs. of cream, but care should be taken to insure that off-odors do not occur after a time. Spermaceti and cetyl alcohol will increase the body of the cream and are used by some makers to replace stearic acid. "Carbowax" already mentioned as a surface-active agent is also used to give body to the pastes. The addition of borax or trisodium phosphate to the milky type shampoos up to a maximum of one per cent is said to improve color stability. de Navarre mentions the use of equal parts of a wetting agent and aluminum magnesium silicate gel. Another superfatting agent, "Albasol BF," made by National Oil Products Co., Harrison, N. J., is used as a hair conditioner. "Albasol BF," a derivative of castor oil, is useful to offset the over-drying effect attributed to the more efficient detergents.

A NUMBER of formulae for cream shampoos of the soapless type using their synthetic detergent "EMCOL 3180" are suggested by the Merchants Chemical Co., New York. A few on their list are offered below:

(1) Milky liquid type:

	Per Cent
EMCOL 3177	75
Water	21
EMCOL LI	2
Cetyl alcohol	2
TOTAL	100

Mix all aqueous, water soluble (including the preservative) and oily ingredients with continuous stirring while heating to 60°C. While stirring continuously, cool rapidly to 30 or 35° and fill.

(2) Paste or Cream type:

	Per Cent
EMCOL 3180	60
Brine solution (25 per cent sod. chloride)	34
EMCOL ML	6
	100

Mix all aqueous, water soluble (including the preservative), and oily ingredients with continuous stirring, and heat to 70°C. While continuously stirring, cool slowly to 40°C. and fill containers.

(3) Type using spermaceti:

	Per Cent
EMCOL 3180	60.0
EMCOL P-80	9.4
Spermaceti	0.6
Sodium hydroxide (NaOH)	0.67
Water	29.3
TOTAL	99.97

Dissolve the sodium hydroxide (as such) in the water specified and heat the solution to 70°C. (158°F.). Melt the EMCOL P-80 and spermaceti together and, with continual stirring, add this molten mix to the warm solution of sodium hydroxide. Continually stirring, add the EMCOL 3180 at room temperature to this mixture (the temperature of the EMCOL 3180 before adding to this mixture should not be below 24°C.-75°F.). When all of the EMCOL 3180 has been added, stirring continuously, cool to 35°C. (95°F.) and fill containers.

In each case, a good preservative should be used to the extent of from 0.1 to 0.5 per cent of the finished shampoo. The preservative is dissolved in part of the water required for the formula, and is then thoroughly incorporated into the mix. They recommend their product "M" as useful in cream shampoos.

The Miranol Chemical Co., Irvington, N. J., advise that a cream shampoo may be formulated by using their "Mirapon RK" concentrate and a mixture of potassium laurate and triethanolamine laurate. If laurate fatty acid should not be available, a high titre coconut fatty acid or a coconut fatty acid in mixture with a palmitic fatty acid may be used. The amount of "Mirapon RK" concentrate and laurate should be approximately 50-50. Concentration of both these materials in the final product would depend on price. The very stiff creams can be obtained even with small amounts of potassium laurate content or by using very small amounts of sodium hydroxide for saponification. A small amount of "Albasol BF" in this formulation is suggested as beneficial as a hair conditioner. They suggest as a cream shampoo formula:

	parts
Mirapon RK Concentrate	100
Wecoline AB (E. F. Drew & Co., Boonton, N. J.)	50
Neolat 1-56 (Armour & Co.)	50
Albasol BF (Nat. Oil Prods. Co., Harrison, N. J.)	25
glycerine	25
triethanolamine	20
potassium hydroxide	20
water to bulk to	450-500

Compounding procedure:

Heat all materials except the triethanolamine and the potassium hydroxide with 160 parts of water to approximately 160°F. until all materials have melted. Then dissolve the potassium hydroxide with 50 parts of water and heat to approximately the same temperature of 160°F. Then add triethanolamine to the first mixture followed by the potassium hydroxide solution. Agitate until a homogeneous product is achieved. Allow to cool. If a stiffer product is desired, replace approximately four parts of the potassium hydroxide with three parts of sodium hydroxide. If a thinner product is desired, increase the amount of triethanolamine and decrease the potassium hydroxide content.

"Mirapon RK" is a fatty acid of the coconut oil type with a titre of 28°C., fractionated to meet particular specifications in that the lower boiling, skin-irritating fatty acids have been removed. "Neofat 1-56" is a fatty acid of the palmitic type.

The above formulae in themselves may not, in each case, offer the best product to suit a particular need, but are suggested as starting points for further development and modification.

A NUMBER of typical cream shampoo products are currently reported to be selling rather well in consumer and beauty shop markets. The Raymond Laboratories, Chicago, make "Nu-Ray Creme Shampoo," a liquid sold to beauty operators in 16 oz. containers. This is a milky type. Their "Ray Fluff Creme Shampoo," is a paste type product sold in one and four pound jars to the beauty trade. The product is sold to retail purchasers in 6 oz. jars and 2¾ oz. tubes. "Rayve Super Concentrate Cream Shampoo" sells in 16 oz. or gallon bottles. This is a pink, milk type liquid. "Zeno Liqua Fluff Shampoo," is a milky liquid sold by the gallon to the operators. "Rayve," is a retail item sold as a paste in tubes and

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Phosphates in Liquid Soap

By Dudley Bachrach*
Clifton Chemical Co.

PHOSPHATES have a value in the manufacture of liquid soaps of which very little has been mentioned or published. With the present short supply of all phosphates, recommendations resulting from studies can only have a value for some future use. Prior to the war and the present shortage of phosphates, salesmen were high in their praise of tetrasodium pyrophosphate as a means of increasing the lathering properties of soaps and considerable quantities went into soda soaps. For the liquid soap manufacturer, however, using chiefly coconut oil, this characteristic of TSPP did not mean a great deal because profuse lather had never been a problem in potash coconut oil soaps. When liquid soaps had to be made from poor lathering oils, and fatty acids during the war years, the use of TSPP would have been of value. Unfortunately, during this period TSPP was equally as hard to get as high lathering oils. Now with coconut oil again available, there would seem to be less need for the employment of such materials as TSPP to aid lathering.

Even though the addition of TSPP in liquid coconut oil soap might have but little value, a trial was undertaken anyway. The first experiment came to grief. About 100 pounds of powdered anhydrous TSPP was sifted into a kettle containing 8,000 pounds of liquid soap. To the consternation of those engaging in the experiment, the phosphate sank to the bottom of the kettle and formed a glassy mass and prevented the liquid soap from running out through the discharge pipe. A pickaxe was required to chop up the phosphate mass and permit the soap to flow from the kettle.

In the second trial, 100 pounds of TSPP was dissolved in 50 gallons of hot water and was added to the soap without trouble. The soap was boiled up in the usual way and samples taken for testing. This showed that the lathering qualities of the soap were not increased. However, the soap solution upon filtration was more brilliant than the same soap minus the TSPP. This was probably due to the well-known calcium ion sequestering effect of pyrophosphates. One gram of TSPP is supposed to sequester about 1/10 gram of calcium salt equal to the hardness of many gallons of water. So the addition of a very moderate amount of TSPP acts to prevent the precipitation of calcium salts and clouding of the solution. In the manufacture of shampoo soaps for sale in glass bottles, this should permit the marketing of a better looking product.

When war broke out in the Pacific, TSPP was being used to a limited extent in liquid soap manufacture, but it soon became very scarce. Also, with the elimination of our chief source of supply for coconut oil, a complete change over in soap formulae was necessary. From 100 per cent coconut oil, liquid soap makers were reduced to 20 per cent and later 10 per cent, and instead of whole oils, fatty acids of one type or another had to be used. With this development, TSPP became practically unobtainable at a time when it was most likely to be needed to a greater extent than ever. About the only obtainable phosphate suitable for detergent use was trisodium phosphate. In some respects, this latter proved to be superior as an ingredient of liquid soaps particularly in making them from fatty acids.

If the chemical formula for two molecules of trisodium phosphate is written as $Na_4P_2O_7Na_2O$, it appears very much like the formula for TSPP plus an amount of caustic soda. When used in liquid soap, roughly 100 pounds of commercial TSP was found to be equivalent to 10 pounds of caustic soda and 40 pounds of TSPP. With the use of fatty acids in liquid soap, it was simple to use alkalies weaker than caustic potash to saponify them. So, TSP was tried out as a means of saponifying fatty acids. The saponification worked well and gave a finished liquid soap of greater brilliance than that obtained from the original use of TSPP. However, there are objections to using TSP completely in place of TSPP.

In the days when coconut oil was used alone and saponified with caustic potash, it was found that the pH was lower when TSPP was present. In seeking for an explanation of this, TSP is visioned as TSPP with a caustic soda tail. Conversely, it would seem that when TSPP is added to a caustic alkali that the TSPP takes up about 20 per cent of it and converts it to TSP. When a diluted solution of caustic potash in water is buffered by the addition of TSPP, the pH is very materially reduced. As the pH of TSP is far less than that of caustic potash, it would seem that here is the method of solving a slight excess of caustic alkali necessary to form a clear solution and yet make the excess harmless.

In practical use, it has been found that the best mixtures of phosphates comprise two parts by weight of TSP,—half of it is water of crystalization.—and one-half part of TSPP. To many firms who purchase a potash soap base and dissolve it to make their liquid soaps, this use of phosphates may also have some value. Most soap base contains some small amount of unsaponified oil or fatty acid which makes the diluted solution cloudy. The use of a

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* Based on an address before the Potash Soap Division, Association of American Soap and Glycerine Producers, New York, Jan. 10, 1946.

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TRADE NEWS. . . .

Coith Visits Germany

Dr. Herbert S. Coith, associate chemical director for Procter & Gamble Co., Cincinnati, left for Germany late in June. He will study new synthetic detergents and emulsifying agents, as well as the production of fatty acids, fatty alcohols, synthetic glycerine and fats.

Issue Composite WFO-42b

The Department of Agriculture has just issued a composite text of the latest version of WFO-42b, incorporating the original order and the ten amendments, including the latest amendment issued July 3. Individuals concerned with the order are advised that one typographical error occured in printing. The end use certificate refers to "use under paragraph (c) (2)," although no end use certificate is required under this paragraph.

Crutcher New Soap Chief

W. J. Crutcher has recently taken over the duties formerly exercised by W. A. McConlogue as chief of the Soap and Glycerine Section, Industrial Oils Division, Fats and Oils Branch of USDA. It is understood that Mr. McConlogue is returning to Colgate-Palmolive-Peet Co. who released him for government service during the early years of the war. Mr. Crutcher was formerly assistant to the sales manager, Memphis sales division of Southern Cotton Oil Co. Early in the war he joined the Fats and Oils Branch of the USDA, becoming chief of the Edible Oils Division. At the end of 1944 he went to Guatemala as assistant to the Commercial Attache, returning early in 1946 to rejoin Southern Cotton Oil Co. He has now been released again for service in the Department of Agriculture.

Herrmann Succeeds Jasspon

Omer Herrmann has just been named director of the Fats and Oils Branch of the Production and Marketing Administration, USDA, succeeding W. H. Jasspon who will continue to serve as a consultant to the Production

OMER HERRMANN

and Marketing Administration. Mr. Herrmann was until recently Colonel Herrmann, serving on General Eisenhower's staff as chief of the Food and Agricultural Section of SHAEF. He was in charge of feeding of civilians and agricultural rehabilitation in north western Europe. He has been in government service since 1931. Prior to the war he was in charge of cottonseed and other vegetable oil seed research for the Farm Credit Administration.

New Plant for Armour

Armour & Co., Chicago, has made plans for construction of a new chemical plant in which several new chemical products will be manufactured, George A. Eastwood, president, announced at a special meeting of stockholders in Chicago, July 17.

Margaret O'Brien Toiletries

Anouncement of the Margaret O'Brien line of toiletries for little girls was recently made at a reception to the movie starlet by the Ali Baba Corporation, New York, at the Waldorf-Astoria, New York.

Soap Plant At LaGrange

A new soap and paint plant was planned for installation in July at LaGrange state reformatory at Frankfort, Ky. The new plant is expected to meet the needs of the state's penal and charitable institutions and was approved after the warden saw operation of a similar plant in Tennessee.

Fat Salvage Report

The American Fat Salvage Committee has recently mailed to subscribers to and supporters of the program a report on operations during the first six months of 1946. Figures for May indicate that 13,441,000 lbs. of salvaged fats were turned over to meat dealers, compared with 13,965,000 lbs. in April. In spite of the discontinuance six months ago of red points for salvaged fat, average collections still continue at a comparatively high level. Through May 1, 1946 a total of 675,000,000 lbs. of fats have been salvaged since the start of the program.

Sugar Beet Prods. Expands

The Sugar Beet Products Co., Saginaw, Mich., recently opened a branch office for their chemical by-products division at 6231 Natural Bridge Road, St. Louis, 20, Missouri. The new office will be the headquarters of the St. Louis district. Jack C. Ashton is district representative.

AMA Honors Erlick

Robert E. Erlick, manager of market research for the Pepsodent division of Lever Bros. Co., has been elected president of the Chicago chapter of the American Marketing Association.

Venetian Blind Cleaner

Powers Products, 8101 S. Ingleside Ave., Chicago 19, has placed on the market a new product, "Powers Venetian Blind Magic Cleaner." A 1-lb. can retails for $1.

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With its final touch of quality, Dow Indol ranks among the trusted materials of the discriminating perfumer. Dow prepares this fine Aromatic with meticulous attention to detail, checking and rechecking the finished product for chemical purity and fidelity of odor. ☆ Indol is one of the widely used Synthetic Aromatics, indispensable in the preparation, for example, of jasmine and orange-flower scents. Dow Indol offers to the blender the twin advantages of quality and uniformity that characterize the entire Dow Line of Synthetic Aromatic materials.

DOW AROMATIC PRODUCTS: Coumarin, Cyclotene, Diphenyl Oxide, Diphenyl Methane, Gardanthrol, Indol, Methyl Anthranilate, Methyl Phenyl Carbinyl Acetate, Methyl Salicylate, Palatone, Phenyl Ethyl Acetate, Phenyl Ethyl Alcohol, Styrene P-100, Sylvenol, and others—

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Spray Type Car Cleaner

Turco Products, Inc., Los Angeles, introduces a new method of cleaning delivery trucks through an air-driven, spray application of its "Turco" car shampoo. Applying this cleaner with the new dispensing unit, it is reported that one operator can clean a 21-foot truck in about 22 minutes. The complete story of this new cleaning method is told in a 4-page folder, "An Immaculate Fleet Can Help Sell Goods". Requests for copies should be made direct to the manufacturer.

British Soap Ration Cut

A further reduction in the British soap ration, due to the fats and oils shortage, was announced recently in England. There will now be six coupons instead of seven for each eight-week period and each coupon will permit the purchase of three ounces of toilet soap, four ounces of hard soap, six ounces of soft soap or three ounces of soap flakes.

Friedman Acquires Thoro

Lt. Donald L. Friedman, USNR, recently returned from three years submarine duty in the Pacific ocean areas, has taken over the Thoro Chemical Products Co., Los Angeles. The company is building a new plant for the manufacture of chemical cleaning supplies in Van Nuys, Calif. Mr. Friedman was formerly owner of the Tryaid Chemical Co., Youngstown, Ohio.

Shulton Appoints Hills

Shulton, Inc., New York, announces the appointment of Frances Hills as publicity director, to succeed Ruth Ann Bolway who has resigned. Miss Hills has been a free lance magazine writer and prior to joining Shulton, Inc., wrote copy for Lucien Lelong.

Joins Fair Trade Council

The Kleer Company, Bradford, Pa., manufacturers of liquid glass cleaner, fog-proofing compound, furniture polish, and cleaning compounds joined the American Fair Trade Council recently.

Lever Advances Palmer

Lever Brothers Co., Cambridge, announced on July 10th the appointment of William E. Palmer as a division manager. Mr. Palmer returns to the territory where in 1941 he started his field career for the firm and which comprises the principal cities of Baltimore, Washington, D. C., Harrisburg, Pa., Norfolk, Va., and Richmond, Va. Mr. Palmer, who is 33, attended Boston College and in 1936 joined Lever Brothers at its home office in Cambridge, Mass., later transferring to the field force. Most recently he was field supervisor in New York City.

WILLIAM E. PALMER

A.O.C.S. Chicago Meeting

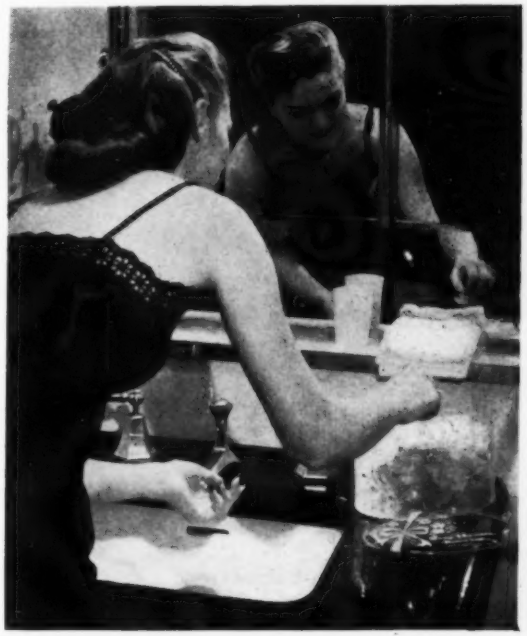
Dates for the 20th annual fall meeting of the American Oil Chemists' Society have been announced as being October 30, 31, and November 1st. The meeting will be held at the Edgewater Beach hotel, Chicago, and George A. Crapple of Wilson and Co., Chicago, will be general chairman.

Reiling Joins Brown Co.

The Brown Co., producers of cellulose and allied products recently announced the addition of Thomas L. Reiling to its technical service division in Chicago. Reiling was employed as research chemist by Monsanto Chemical Co., Springfield, Mass., from 1939 to 1942. During his term of military service, from 1942 to 1946, he worked with the Resident Inspector, Naval Material, Sylvania Electric Products Co., Ipswich, Mass., as executive officer of the proximity fuse project. He was discharged with the rank of Lieutenant.

Mutual Appoints Alexander

The Mutual Chemical & Supply Co., Columbus, Ohio, manufacturers of soap products, cleaners, & insecticides, announced last month that S. J. Alexander, recently discharged from the Navy, has been appointed sales manager.



SOAP FLOWERS

A new film soap is now being marketed in the form of delicately scented soap flowers in many pastel colors. The soap flowers are made and distributed by Florence Barton, Inc., New York, and are packaged in attractive transparent cellulose acetate boxes. The boxes, made by the Union Specialty Co., Plainfield, N. J., contain either 50, 100, or 200 soap flowers. The film - forming ingredient is CMC, a Hercules Powder Co. chemical.

Cosmetic Firm Organized

Advanced Cosmetics, Inc., New York, has been formed as a private brand cosmetic company. Office and

JAMES H. McMANUS

plant are at 38-31 Crescent St., Long Island City, N. Y. A New York sales and display office will be opened later on East 57th St., near Fifth Avenue. Principals of the firm are Maximilian Gotham, president; James H. McManus, secretary and sales manager; and Charles Bock, treasurer. During the war Mr. Gotham was in charge of the technical department of one of Army Ordnance's largest explosive installations. Prior to war service he was for twelve years engaged in New York in the development and manufacture of private brand cosmetics, developing numerous formulae used by nationally known concerns. He will direct manufacture. Mr. McManus, was the founder in 1920 of McManus Laboratories, Inc. He just completed three years with Chemical Warfare Service in New York, serving since 1944 as assistant chief, chemical section of the manufacturing division. Mr. Bock was formerly president of the Coiffure Guild. The new firm commenced operations on July 1.

Must Improve Dish Washing

At a meeting in New York last month of delegates from drug stores, dime stores, and confectioners, New York City Health Commissioner Israel Weinstein announced that the sanitary code would be amended to require that a separate section of such stores be reserved for dish washing, this change to become effective in August. The Commissioner rejected pleas that health inspectors serve bills of particulars of improvement demanded rather than summonses, and stated that the only exception to the ban to under-the-counter dish washing will be those stores equipped with modern mechanical dishwashers installed as part of the fountain. The Health Department has offered to help any proprietor get a priority for such machines.

Dow to Get Medal

It was recently announced by the Society of Chemical Industry that Dr. Willard H. Dow has been awarded the Chemical Industry Medal for 1946 for "conspicuous service to applied chemistry" particularly in the wartime production of synthetic rubber and recovery of raw materials from sea water.

Klaussen At Bikini Test

Bjarne Klaussen, works manager of the Niagara Falls, N. Y., plant of the Hooker Electrochemical Company, was one of a group of industrial representatives to witness the atomic bomb "Test A" at Bikini Atoll in July. Head of the Manhattan Engineering Project, Mr. Klaussen is one of the Manhattan District special representatives, a group of approximately twenty men from industries closely associated with the atomic bomb project.

C.D. C.A. Members

At a recent meeting of the Chicago Drug and Chemical Association, the officers and board of directors elected to honorary (class C) membership in the Association the following men who are retiring from active business: Frank McCartney, Edward G. Roberts, Ray A. Whidden, Lawrence C. Shepherd, Rock K. Snow.

Nippert to Credit Board

George H. Nippert, division credit manager at Chicago for Procter & Gamble Distributing Co., was elected a member of the Board of Directors of the National Association of Credit Men at their midsummer convention.

Stevenson Rejoins Givaudan

J. K. Stevenson, manager of the Detroit office of Givaudan-Delawanna, Inc., has been released from

J. K. STEVENSON

active duty in the Army Air Forces and has returned to his position with the Givaudan organization. Mr. Stevenson served with the Air Technical Service Command as a statistical control officer and later was assigned to duty with the Strategic Bombing Survey as executive officer of the Statistical Section at European Theatre Operations headquarters. He was awarded the bronze star medal in that theatre and retired with the rank of major.

Toilet Goods Chicago Show

The fourth annual toilet goods show of the Chicago Associated Toiletries Salesmen will be held at the Palmer House, Chicago, August 19th to 28th inclusive. The entire seventh and eighth floors of the hotel are reserved for exhibitors. The show opens at 9:00 A. M. Monday, August 19th and closes at 12:00 noon Wednesday, August 28th.

Berger Seattle Manager

Lester D. Berger, Jr., has recently been appointed manager of a new Seattle office for Carbide and Carbon Chemicals Corp., located at 2901 First Avenue South. Mr. Berger has been with the organization since 1940 and before the war was located at the Company's main office in New York. He served in the Navy during the war as a Lieutenant Commander with the South Atlantic Fleet.

F. W. Smithers Retires

F. W. Smithers will retire as Chief of the detergents and miscellaneous section of the Division of Chemistry, National Bureau of Standards on August 31. Mr. Smithers, whose federal service started forty years ago, has served throughout the years on many standards and policy-making committees in the soap and oils field. He aided in the development and revision of specifications on chemical products, laundry equipment, and floor treatments. As chairman of the Federal Specifications Board's Technical Committee on detergents since the committee was organized in 1921, and as chairman of the A.C.S. committee on soap and soap products from 1935 to 1946. He has acted as vice-chairman of the A.S.T.M. committee D-12 since the committee was established in 1936, and was a member of soap analysis committee, A.O.C.S. from 1926 to 1946. Previous to his association with the Bureau of Standards, Mr. Smithers was with the Department of Agriculture for 7 years. He graduated from the University of Virginia and spent several years working in industrial laboratories before joining the government service.

Kent Soap To Build

The Kent Soap Products Co., New York, recently purchased a 10,000 square foot plot in Long Island City, Queens, N. Y., where a one-story factory will be erected for the manufacture of soaps for the towel supply industry.

Peyton Starts Law Firm

Gordon Peyton, formerly with the U. S. Department of Agriculture, recently announced the opening of offices for the practice of law in the Shoreham Building, Washington, D. C.

New Plant For Iowa Soap

A new million dollar manufacturing plant will be built in Fort Worth, Texas, by Iowa Soap Co., Burlington, Iowa, and Camden, N. J. The Company makes "Magic Washer", "Nola", "Protex", and "Barr's Mechanic" soaps, as well as industrial bulk soaps for laundries, hotels, institutions and manufacturers. The new Texas plant will have a normal capacity of approximately 25,000,000 pounds of soap annually, composed mostly of powders, flakes, and household toilet bars, and will employ approximately 200 people. With the exception of a few technical and key personnel, those employed will be Fort Worth people. The building will be of brick and tile mill type construction, with a truck-loading platform, as well as two spur railroad tracks to the rear of the plant. There will be four or six outside material storage tanks with a capacity of 1,000,000 pounds each, plus numerous tanks throughout the inside of the factory. The power plant will have two 300-horsepower boilers and auxiliary equipment. A cafeteria will be included together with up-to-date equipment and conveniences for the workers. There is ample acreage for new buildings and construction of additional facilities at a later date.

McManus Lever Treasurer

On July 8, Michael A. McManus was elected treasurer of Lever Brothers Co., Cambridge, Mass., succeeding

MICHAEL M. McMANUS

Arthur P. MacIntyre who was recently elected vice president in charge of finance. A native of Cambridge and a graduate of Boston University, Mr. McManus joined Lever Brothers twenty-five years ago as an invoice clerk. Later he was responsible for accounting in all divisional sales offices and branch plants. Since 1936 he has been assistant treasurer of the company.

Soaps at Grocers Show

Procter & Gamble Co., Cincinnati; Lever Bros. Co., Cambridge, Mass., and the Allen B. Wrisley Co., Chicago, displayed their lines of laundry and toilet soaps at the convention of the National Association of Retail Grocers in Chicago, late in June. Manufacturers of household cleaning products participating in the exhibition included Boyle-Midway, Inc., Oakite Products, Inc., the O'Cedar Corp., all of Chicago, and Wilbert Products Co., New York.

New Wetting Agents

"Naybasols" are new wetting agents developed by the Naylee Chemical Co., Philadelphia. They contain strongly solubilizing groups, which increase wetting and detergent action. At the present time they are used extensively in the processing of textile fibers, synthetic latex, dairy cleansers, shampooing liquids, and nonmetallic flotation agents.

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Hollingshead Ups Three

R. M. Hollingshead Corp., Camden, N. J., recently announced the promotion of three executives to key positions. John R. Flynn, who was named comptroller, started in the company's accounting department in 1925. In 1936 he was appointed assistant to the chief accountant and helped to develop the company's present accounting procedure. He advanced to the post of auditor in 1942. In 1945, the company announced his appointment as assistant secretary, a position he still retains in addition to his duties ase comptroller.

JOHN R. FLYNN

VICTOR M. MANTZ

ALBERT E. MOORE

Albert E. Moore was appointed to the position of chief chemist and will supervise the mixing and compounding departments, rubber plant, control laboratory, and also control the scheduling of raw materials. Mr. Moore joined the company in 1923 and in 1928 was promoted to assistant chief chemist. For about two years he served as production manager and assistant plant manager, and then in 1945 returned to the laboratories to supervise compounding and quality control.

The promotion of Victor M. Mantz to the post of director of research was also announced. Mr. Mantz became associated with Hollingshead's laboratories in 1931 as supervisor of grease production. He established a new standardization of physical and chemical control on greases and lubricants, and was responsible for production improvements in the manufacture of greases and other Hollingshead products. In 1944, he was made assistant director of research.

Owens Advances White

Kenneth C. White, general sales manager of Libbey Glass division of Owens-Illinois Glass Company, has been appointed sales promotion manager of the company's glass container division, effective August first. He will succeed Howard A. Trumbull who resigned recently to form his own research concern. Mr. White has been associated with the glass industry for nineteen years, becoming sales manager of the company's food and dairy divisions in 1935 and manager of the San Francisco branch in 1941. Most of his duties at Libbey are now being assumed by William M. Beckler who has been named manager of sales of table glassware and R. W. Rogers who continues as sales manager of industrial products.

Cahall Abroad For Hercules

William L. Cahall, appointed July 19th as sales manager of the export department of Hercules Powder Co., Wilmington, left for Honolulu August 15th on the first leg of an eight month trip to the Hawaiian Islands, China, the British Crown colony of Hong Kong, the Philippines, Netherlands East Indies, Singapore, India, and the Union of South Africa. While abroad, he will re-establish and determine new distribution outlets for Hercules products, visit customers, and appoint distributors for some of the company's newer products, especially toxic agents for insecticides which were not exported in pre-war days.

New Cleaner for Bakers

A technical data sheet on baking pan cleaners was announced recently by Nielco Laboratories, Detroit. The sheet describes the use of "Nielco 1934-B," a mild alkali cleaner in powder form, in the cleaning of baking pans by power washers and in vats and soak tanks. Mention is also made of "Nielco 1930-MS," a cleaner used in building maintenance, and of "Nielco 1930-CW," a car washing compound. The technical data sheet may be obtained by writing Nielco Laboratories, 1632 W. Lafayette St., Detroit 16, Mich.

Chem Salesmen Golf

More than 120 attended the Chemical Salesmen's Association golf outing at Winged Foot Golf Club in Mamaroneck, N. Y. on July 24th. Despite the year's worst rain storm, some 85 die hards entered the tournament. In the first flight, Tom Morgan, MacNair-Dorland Co., won low gross and J. C. Abeles, Faesy & Besthoff Co., won low net. In the second flight, Charles W. Frost of Prior Chemical Co. won low gross, and L. Brennesholtz of Centaur Co. won low net. Low gross for the third flight was won by Paul Hiller, Innes Spieden Co., with Jack Henry, Jos. Turner & Co., winning low net. Prizes for members kickers went to Charles Alexander, L. Sonneborn Co., Wm. B. Mullen, Jos. Turner & Co., and R. C. Quortrop, Barrett Co. H. R. Miller of McKesson & Robbins took the longest drive prize and Russel Dixon of Wm. D. Neuberg Co. was nearest to pin. The association is planning an outing on August 20th at the Plainfield Country Club, Plainfield, N. J. This will be the only get-together before the final meeting on September 19th at Plandome Golf Club, Plandome, N. Y.

van Ameringen in Europe

Arnold L. van Ameringen, president of van Ameringen—Haebler, Inc., New York, left for Paris on August 4th for a month's visit with associates and principals in the perfume and flower oil industries of France, Holland and England, where he will observe the progress effected in the rehabilitation of the industry since his last visit at the close of hostilities in Europe last year. Accompanying Mr. van Ameringen on his tour was Dr. James H. McGlumphy, vice-president in charge of the flavor department of the organization. Dr. McGlumphy planned to investigate new European developments in the flavoring field. Both Mr. van Ameringen and Dr. McGlumphy expect to return early in September.

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NEW TRADE MARKS

The following trade-marks were published in the July issues of the *Official Gazette* of the United States Patent Office in compliance with Section 6 of the Act of September 20, 1905, as amended March 2, 1907. Notice of opposition must be filed within thirty days of publication. As provided by Section 14, fee of ten dollars must accompany each notice of opposition.

Trade Mark Applications

MEDALO—This in lower case, open letters across a medal and ribbon between parallel lines of various thicknesses for tooth paste, tooth powder, bubble bath oil, shampoo, etc. Filed Jan. 22, 1944 by Gold Medal Hair Products, Brooklyn. Claims use since June 1, 1945.

PER-SOLV—This in upper case, extra bold, black letters for solvent for dissolving grease and oil from metallic bodies. Filed June 26, 1945 by Circo Products Co., Cleveland. Claims use since Mar. 16, 1945.

(Drawing of Marie Schwartz in dancing costume)—for shampoo. Filed Sept. 15, 1945 by Cosmetics, Inc., Nashville, Tenn. Claims use since Aug. 1, 1941.

KAL-ZOO—This in upper case, extra bold letters for insecticides. Filed Oct. 29, 1945 by Parsons Chemical Works, Grand Ledge, Mich. Claims use since Feb. 20, 1945.

LASSIE—This in upper and lower case, reverse, script letters within a circle above and between the words "Dog . . . Essential 'For Masters Who Care'," which are above the drawing of the head of a dog, for dog shampoo. Filed Nov. 16, 1945 by Rex Stuart Co., New York. Claims use since Sept. 3, 1945.

TABU—This in upper case, bold letters for insecticides. Filed Dec. 15, 1945 by Consolidated Cosmetics, Chicago. Claims use since Dec. 12, 1945.

HERETOX—This in upper case, extra black bold letters for household insecticide. Filed Dec. 15, 1945 by Heresite & Chemical Co., Manitowoc, Wis. Claims use since Sept. 18, 1945.

BUG-ZOOKA—This in upper and lower case, reverse letters on a rectangular background on which appear the drawings of insects, for insecticides and disinfectants in solid, powder and liquid forms. Filed Feb. 1, 1946 by Allied Exterminating Co., New York. Claims use since Jan. 15, 1945.

PESTROY—This in upper case, extra bold, black letters for pest inhibiting compositions. Filed Feb. 4, 1946 by Sherwin-Williams Co., Cleveland. Claims use since Sept. 4, 1919.

FLY-CIDE—This in upper case, bold letters for insecticides. Filed Feb. 8, 1946 by Magnolia Chemical Co., Jackson, Miss. Claims use since Jan. 1, 1932.

HOROSCOPE—This in upper case, bold letters for shampoo. Filed Mar. 5, 1946 by Elsie M. Bayard, Evanston, Ill. Claims use since Mar. 1, 1946.

ANTURAT—This in upper case, extra bold letters for rodenticide. Filed Mar. 25, 1946 by Dr. Hess & Clark, Inc., Ashland, O. Claims use since Feb. 22, 1946.

PLAZEX—This in large and small, upper case, bold letters for powder for cleaning combs and brushes. Filed May 23, 1945 by Zeidman and Lieberstein, Brooklyn. Claims use sinc Apr. 16, 1945.

VICTORY—This in upper case, bold, reverse letters within a circular design, for chemical cleaning preparation. Filed Aug. 17, 1945 by Victory Soap & Chemical Co., New York. Claims use since Jan. 2, 1944.

SHERBOND—This in upper case, black, bold letters for chemical preparation for cleaning and preparing metal surfaces for painting. Filed Oct. 8, 1945 by Neilson Chemical Co., Detroit. Claims use since Sept., 1943.

THENARDOL—This in lower case, extra large and bold letters for antiseptic solution. Filed Jan. 10, 1946 by International Pharmaceutical Corp., Boston. Claims use since Nov. 28, 1945.

SANITATOR—This in upper and lower case, extra bold letters for chemical preparation for absorbing disagreeable odors. Filed Feb. 2, 1946 by Puritan Chemical Co., Atlanta. Claims use since May 5, 1945.

ENTOSPRAY—This in upper case, bold, letters for DDT concentrate solution. Filed Feb. 19, 1946 by Lederle Laboratories, Inc., New York. Claims use since Jan. 21, 1946.

"346"—This in bold numerals within two bold circular lines between which appear the words "Sage Brush" and "Brooks Brothers" for shaving soap. Filed Feb. 17, 1945 by Brooks Brothers, New York. Claims use since Oct., 1940.

FOAM-ADE—This in upper and lower case, extra bold, italic letters for soap for cleaning and shampooing rugs and upholstery. Filed Dec. 15, 1945 by Burkin Process Co., Bethesda, Md. Claims use since Oct. 9, 1945.

LIXSO—This in upper case, reverse letters on a spheroid background for soap. Filed Jan. 4, 1946 by Lixso Products Co., New York. Claims use since 1938.

SASOCO—This in upper case, bold, script letters for disinfectant and deodorant. Filed Oct. 6, 1945 by Sanitary Soap Co., Paterson, N. J. Claims use since Jan., 1943.

RUSTABOO—This in upper case, bold, italic letters for chemical and detergent preparation for cleaning and preparing metal surfaces for painting. Filed Oct. 13, 1945 by Neilson Chemical Co., Detroit. Claims use since Apr., 1938.

RAY.O.SAN—This in upper case, extra bold letters for insecticides. Filed Nov. 23, 1945 by Causo Trading Co., New York. Claims use since Nov. 15, 1945.

MONOCOCATE—This in upper case, bold letters for coconut oil fatty acid monoester of glycerol and for coconut oil fatty acid monoester of propylene glycol used as solvents, surface active agents and for other purposes. Filed Dec. 21, 1945 by Colgate-Palmolive-Peet Co., Jersey City, N. J. Claims use since Apr. 23, 1945.

KYNAL—This in upper case, extra bold letters for tooth paste and tooth powder. Filed Nov. 1, 1945 by

More and more manufacturers are switching to HARDESTY fatty acids and their derivatives, following a trend that started when HARDESTY's first shipment was made. This trend was accentuated during the war when HARDESTY products provided many answers to the problems created by shortages of imported raw materials.

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HARDESTY has kept this trend going upward as a result of its never-ending research. Our laboratory technicians—with long experience in the chemistry of fatty acids—are constantly demonstrating to manufacturers how they can save money by first consulting HARDESTY on a new problem.

HARDESTY products are available in sufficient quantities to meet manufacturing schedules and priced to fit cost sheets. If you have a problem—old or new—our technical knowledge and experience are ready to go to work for you.

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Elars Products, Inc., Richmond, Va. Claims use since May 20, 1936.

ENDS-ALL—This in upper case, bold letters for roach powders and other insecticides. Filed Feb. 21, 1946, by Edin & Co., Minneapolis. Claims use since Oct. 15, 1944.

GELCO—This in upper case, extra bold letters for floor wax. Filed Aug. 31, 1945 by Gelin Co., Cleveland. Claims use since Jan. 1, 1936.

AUTOMIC—This in upper case, bold letters for combined cleaner and polish for automobiles and furniture. Filed Oct. 10, 1945 by Automic Cleaner-Polish Co., Buffalo. Claims use since Sept. 3, 1945.

CHEM-SPRAY—This in upper case, medium letters for cleaning guns for mixing, atomizing and applying cleaning liquids in the washing and cleaning of airplanes and automotive and similar vehicles. Filed July 30, 1945 by Southern Supply Co., Pasadena, Calif. Claims use since Aug. 12, 1939.

TOILETRIES IN GOLD—This in upper case gold letters for shaving creams and hand soaps. Filed Sept. 21, 1945 by "42" Products Ltd., doing business as Winsor House, Ltd., Los Angeles. Claims use since Aug. 28, 1945.

SPOT-NOK—This in upper case extra bold letters for cleansing powder. Filed Dec. 4, 1944 by Labratest, Inc., Long Island City, N. Y. Claims use since Nov. 13, 1945.

LIG-MUL—This in upper case letters for soap. Filed Dec. 5, 1945 by H. Lee Wolfe Co., Chicago. Claims use since Feb. 1, 1941.

DEE-ONE—This in extra large upper case letters for cleansing compositions having surface-active and wetting properties. Filed Jan. 10, 1946 by General Aniline & Film Corp., New York. Claims use since Oct. 25, 1945.

ATOMIC INSECTICIDES—This in reverse large and small upper case letters on a sign over a drawing of a falling bomb for insecticides. Filed Oct. 2, 1945 by Worthington Products Co., Arlington, Va. Claims use since Aug. 9, 1945.

PETERMAN—This in upper and lower case bold script for insecticides. Filed Oct. 19, 1945, under 10 year proviso as to the word "Peterman" by William Peterman, Inc., Newark, N. J. Claims use since Sept. 12, 1945.

PETERMAN DISCOVERY — "Peterman" in upper and lower case bold script and "Discovery" in upper case extra bold letters for insecticides. Filed Oct. 10, 1945 by William Peterman, Inc., Newark, N. J., under 10 year proviso as to the word "Peterman" and the word "discovery." Claims use since 1894 on the words "Peterman" and "discovery," and since Sept. 12th, 1945 on the mark presented.

TEKNOL—This in upper case letters for insecticides. Filed Dec. 8, 1945 by Amos R. Beamon, doing business as Teknol Products Co., Los Angeles. Claims use since June 15, 1939.

OLD TRAPPER—This in old-time style upper case bold lettering accompanied by a fanciful sketch of a trapper for powders for killing insects; poisons for killing rodents, and a combination of insecticide and sulfur dust. Filed by J. A. Stanley, Mar. 13, 1946. Claims use since Jan. 1, 1941.

PHILLIPS 66—This in upper and lower case bold lettering on an orange and black shield for glass and metal, pre-wax cleaner and spot remover. Filed Mar. 27, 1944 by Phillips Petroleum Co., Bartlesville, Okla. Claims use since April 1935 on glass and metal cleaner; since April 1938 on pre-wax cleaner; and since Aug. 1931 on spot remover.

TAY—This in heavy script lettering for general purpose cleaning compound. Filed Feb. 2, 1946 by Turco Products Co., Los Angeles. Claims use since Sept. 1, 1945.

SOFTEE—This in large and small bold letters for cleansing preparation for general housework washing. Filed Feb. 12, 1946 by Du-Rite Products Co., Brentwood, Md. Claims use since Jan. 15, 1946.

CARE—This in large bold upper case letters for synthetic detergent cleaner for delicate fabrics. Filed Mar. 13, 1946 by Care Laboratories, Inc., Charlotte, N. C. Claims use since Mar. 2, 1946.

TEX—This in extra bold upper case letters for chemical compounds for washing and cleaning. Filed Apr. 16, 1946 by Climalene Co., Canton, Ohio. Claims use since Apr. 1, 1925.

'SULFATALIDINA'—This in bold upper case letters for pharmaceutical product useful as a bactericide and antiseptic. Filed Jan. 12, 1946 by Sharp & Dohme, Inc., Philadelphia. Claims use since Nov. 2, 1945.

WES-GLO—This in upper and lower case script letters for coconut oil shampoo. Filed Jan. 26, 1946 by Wesco Products, Inc., Buffalo. Claims use since Jan. 15, 1946.

ORG-A-WET—This in upper case stencil letters for organic wetting agents. Filed Feb. 26, 1946 by Quaker Chemical Products Corp., Conshohocken, Pa. Claims use since Feb. 11, 1946.

TRADE MARKS GRANTED

420,715. Chemical product for removing stoppage in waste lines and urinals. Filed by Turner and Horne, New York, June 30, 1945. Serial No. 485,309. Published Feb. 12, 1946. Class 6.

420,721. Chemical compound for preserving wood and fabric. Filed by Cuprinol, Inc., Boston, July 24, 1945. Serial No. 486,193. Published Feb. 12, 1946. Class 6.

420,728. Shampoo. Filed by Lightfoot Schultz Co., New York, Aug. 13, 1945. Serial No. 487,086. Published Feb. 12, 1946. Class 6.

420,737. Tooth powder. Filed by Physicians Dentifrice Co., Redwood City, Calif., Aug. 21, 1945. Serial No. 487,383. Published Feb. 12 1946.

420,741. Wetting agents. Filed by Nuodex Products Co., Elizabeth, N. J., Aug. 25, 1945. Serial No. 487,572. Published Feb. 12, 1946. Class 6.

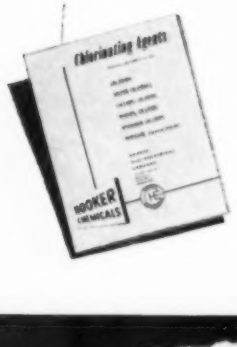
420,799. Cleaner for finished surfaces, textiles and hands. Filed by Eureka Products Co., Chicago, Aug. 7, 1944. Serial No. 473,021. Published Oct. 24, 1944. Class 4.

420,815. Surface tension depressant and hygroscopic agent for producing bubbles. Filed by Aviation Research and Development Corp., Fredericksburg, Va., Jan. 6, 1945. Serial No. 478,304. Published Feb. 19, 1946. Class 6.

420,839. Soap cleanser polish. Filed by Kleen-O-Matic Products Co., New York, June 25, 1945. Serial No.

(Turn to Page 179)

For Chlorine in Convenient-to-Use Form Use Hooker Sulfur Chlorides



The Hooker Sulfur Chlorides, mono- and di-, provide convenient sources of chlorine in chemical processes where the use of elemental chlorine is not feasible. In these Hooker products you can always be sure of a carefully controlled chlorine content. The Monochloride contains a minimum of 50% chlorine, while the Dichloride has a minimum of 66% chlorine.

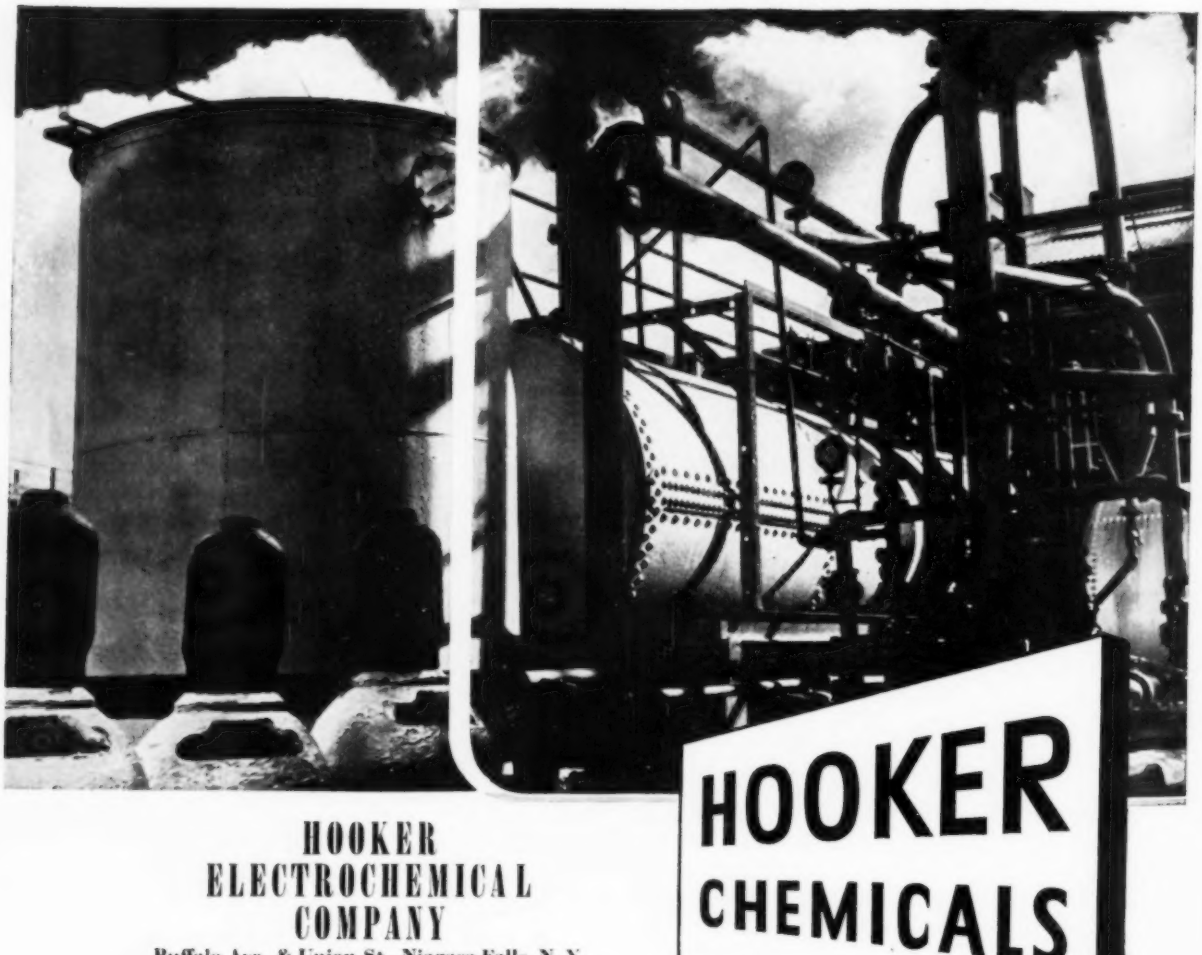
Besides the more common uses as chlorinating agents, the Sulfur Chlorides have a wide variety of possible applications in many different fields. In reactions with unsaturated hydrocarbons it is possible to introduce the sulfur or chlorine or both into the molecule.

Sulfur Dichloride may be used as a chloridizing agent in the refining of various sulfide ores; as a reagent in the manufacture of organic acid anhydrides, various rubber substitutes and other organic chemicals.

Sulfur Monochloride is also used in the manufacture of a variety of organic chemicals. It has been used as an agent for the cold vulcanization of rubber products and in the manufacture of rubber substitutes. It may be used as a solvent for sulfur and as a polymerization catalyst to increase the viscosity of fatty acids.

Hooker Bulletin 328A, "Chlorinating Agents," gives more detailed information on the possible uses of these two Hooker products as well as other Hooker Chlorinating Chemicals. Technical Data Sheets Nos. 759 and 760 describe in more detail the physical properties of the Hooker Sulfur Chlorides. Copies of these bulletins will be sent when requested on your business letterhead. Your problems in handling these Hooker Chemicals will receive the careful attention of our Technical Staff.

A part of the Hooker facilities for the production of chlorinated compounds.



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Paradichlorbenzene · Chlorine · Sodium Sulfhydrate

3058

BIDS AND AWARDS

FWA Bids and Awards

In a recent opening for miscellaneous supplies by the Federal Works Agency, Public Buildings Administration, Office of Buildings Management, Washington, D. C., the following bids were placed on unspecified quantities of floor wax: B. J. Howard Co., 1%, $693, 6 days; United Sanitary Chem. Co., 1%, $907.50; Sherwin-Williams Co., $1,047.75, 15 days: Brilco Labs. $1,047.75, 3 days; R. M. Hollingshead Corp., $1,229.25, 30 days; Socony-Vacuum Oil Co., 2%, $1,262.25, immediately; Hudson Supply & Equipment Co., $1,361.25, 10 days; Bri-Test Products Corp., 1%, $1,369.50, 10 days; Vestal, Inc., 1%, $1,670.62, 10 days. Award for 5,500 gals. liquid soap was received by Trio Chemical Works with a bid of $1,815.

Justice Dept. Bids

The following bids were received in a recent opening for miscellaneous supplies by the Department of Justice: At Seagoville, Texas, 600 lbs. soap powder: H. Kohnstamm & Co., Dallas, 2%, 9⅛c; Selig Co., Dallas, 1%, 9c. At Petersburg, Va., an unspecified quantity of disinfectant: N. Brittingham & Sons, Phila., 1%, $1.30; Joseph E. Franke Co., Philadelphia, 89c; Industrial Distributors, New York, 1%, $1.04; Socony-Vacuum Oil Co., Richmond, Va., 2%, packed 6/1 gal. tins to case, $1.44 gal.; packed 1/55 gal. drum, $1.08 gal.; West Disinfecting Co., Richmond, Va., 1%, $2. At Springfield, Mo., cleaning supplies, etc.: item 1, 270 lbs. bleaching material; 2, 1 drum cleaning compound; 3, 1,500 lbs. sweeping compound; 9, 800 lbs. laundry sour; 11, 176½ lbs. wax; 12, 120 lbs. cleaning compound: Applegate Chemical Co., Chicago, 2% item 7, $2. Atlas Powder Co., Stamford, Conn., item 4, $29; Crystal Soap & Chemical Co., Philadelphia, item 2, 17c lb. alt. DuBois Co., Cincinnati, item 2, $1.45 gal. Barada & Page, Kansas City, Mo., 2%, item 1, 37.77c. lb. H. Kohnstamm & Co., St. Louis, Mo., 2% item 1, 37.77c, item 9, 17c. Arthur S. LaPine Co., Chicago, item 1, 37.77c; item 9, 14.5c; item 11, $2.30. Midland Labs., St. Louis, Mo. 1%, item 2, $1.50 gal.; item 3, 6c; item 6, $2. Missouri-Kansas Chemical Co., Kansas City, Mo. 2%, item 1, 24c; item 6, $1.05. Oakite Products, New York, 2%, item 12, 11.04c. Octagon Process, Brooklyn, 1%, item 1, 42c; 6, $2.40; item 12, 11.04c. Frank B. Ross, Jersey City, 1%, item 11, $2. Selig Co., Dallas, item 1, 37.77c; item 2, 16c lb.; item 6, $1.35 lb.; item 11, 60c; item 12, 12c. Thompson-Hayward Chemical Co., Kansas City, Mo., 1%, item 1, 37.78c; item 9, 16c, f.o.b. Kansas City.

Veterans Adm. Awards

The following awards were announced by the Veterans Administration Procurement Division for miscellaneous supply items: laundry sour and blue: Diamond Alkali Co., $9,056.58. Lewis National Corp., $4,661.88. Crescent Chemical Corp., $1,009.82; dish washing compound: Economics Laboratory, Inc. $28,786.65. floor wax: Trio Chemical Works, $72,022.50. Soaps and detergents: Day & Frick, $3,287.74; Chemical Manufacturing and Dist. Co., $18,438.82; North Coast Chemical & Soap Works, $191.09; Lee Soap Co., $542.65; Peck's Prods. Co., $2,178.70; Pioneer Soap Co., $648.13; Farrar Industrial Prods. Co., $1,696.50; American Soap & Washoline Co., $689.48; Tesco Chemical Co., $198.75; Apex Alkali Prod. Co., $132.14; S. L. Abbott Co., $182.76; Spazier Soap & Chemical Co., $301.33; Dacar Chemical Prods. Co., $1,501.51; Minnesota Chemical Co., $297.96.

Post Office Bids and Awards

The Post Office Department, Washington, D. C., recently made the following awards on bids for soaps opened during June and July: 3,020 gals. liquid toilet soap: Bernhardt Bros., 35c plus $1 deposit for each drum. For 130,000 lbs. scouring powder: Safford Co., 2.45c on 17 M only. On 90,550 lbs. toilet soap: Unity Sanitary Supply Co., 1%, 21c. Bids were received on 19,632 lbs. scouring powder for various destinations; Jos. E. Frankle Co., Phil., 2.31 case, f.o.b. Phil.; Imperial Prods. Co., Phil., 7c can, f.o.b. Phil.; Chemical Mfg. & Distributing Co., Easton, Pa., 3.2c lb. f.o.b. Easton. No bids were received for 24,900 lbs. soap powder.

P. W. A. Insecticide Awards

The Public Works Agency, Public Bldgs. Adm., Office of Buildings Management recently announced the award for an unspecified number of insecticide sprayers to the Sprayer Corp. of America with a bid of 1%, $539.

Post Office Soap Bids

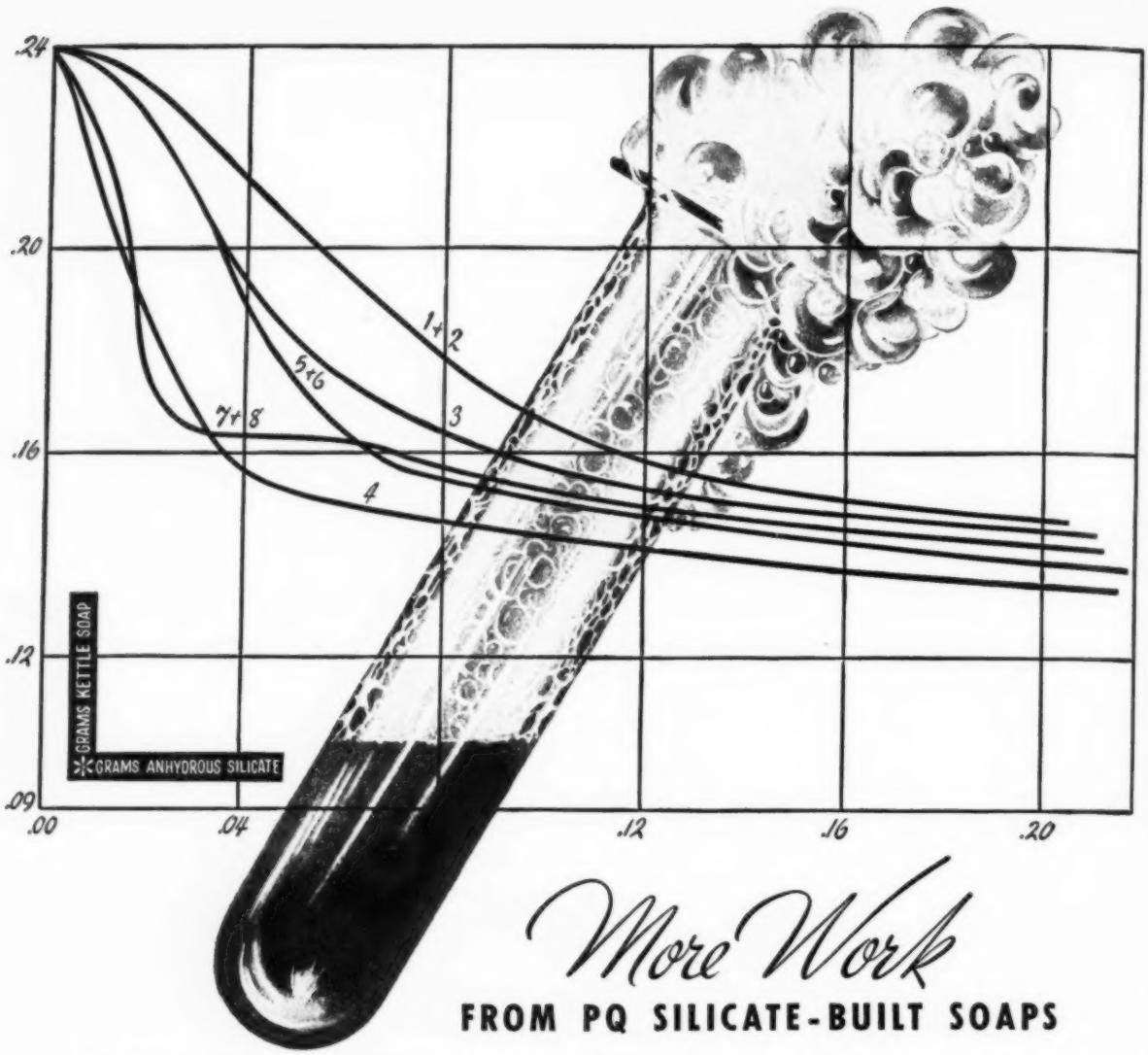
In a recent opening for soap supplies by the Post Office Department, Washington, D. C., the only bidder on 90,550 lbs. toilet soap was Unity Sanitary Supply Co., New York, 1 per cent, f.o.b. New York City, on 10 M lbs. at 21c per lb.

COCONUT OIL OUTLOOK

(*From Page* 40)

ket followers feel that perhaps after a brief drop-off, shipments from the Philippines may increase to monthly averages in excess of pre-war figures. They point out that Philippine industry has been slow in regaining its pre-war basis, thus making a larger labor supply available for the collection of copra.

In another two or three months the picture should be much clearer,—not only as to what we can expect in oil supplies from the Philippines, but what domestic crop expectations may be as well. By early September we will have a better idea of what to expect from the domestic cottonseed, soybean and peanut crops. If these crops look good, and copra continues to leave the Philippines at an increasing rate, the soap maker's outlook for fat and oil supplies over the coming year will be definitely more promising, and ideas might well be entertained of possible quota increases.



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FROM PQ SILICATE-BUILT SOAPS

First, in your own manufacture you save fatty acids by using a higher percentage of silicate of soda. With low titre soaps especially, the increased amount of PQ Silicate improves the body and firmness.

Soap consumers profit also from the silicated soaps through better cleaning results with a less expensive material. And soap wastes caused by calcium and magnesium salts in hard water are cut materially. How the various PQ Silicates aid a typical commercial (mixed) soap to form permanent suds in hard water is plotted on the above chart.

May we share with you the results of our research work that may solve one of your current problems?

* Minimum commercial kettle soap and silicate (anhydrous) to form permanent suds in 100 ml. hard water (300 parts per million $CaCO_3$ equivalent) at 48.8°C. (120°F.)

1. S Brand ($1Na_2O:3.90SiO_2$)
2. SS-65-Pwd. ($1Na_2O:3.30SiO_2$)
3. K Brand ($1Na_2O:2.90SiO_2$)
4. U Brand ($1Na_2O:2.40SiO_2$)
5. C Brand ($1Na_2O:2.0SiO_2$)
6. B Brand ($1Na_2O:1.6SiO_2$)
7. Metso ($1Na_2O:1SiO_2$)
8. Metso 99 ($1Na_2O:0.75SiO_2$)

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PQ SILICATES OF SODA

RAW MATERIAL MARKETS

As of August 1, 1946

REIMPOSITION of OPA price controls was the big development in the market for soap making raw materials last month. After a month of unrestricted trading, during the course of which tallow had advanced to almost 13 cents per lb., price ceilings were clamped down again, and the levels of June 30 restored. A rather confused situation naturally followed, and the outlook would seem to be for a suspension of trading in fats and oils until the future outlook is clarified somewhat. During the month of suspension of OPA ceilings, soap makers were reported to have bought fairly substantial quantities of tallow at the 12½ to 13 cent range and it is rather difficult now to visualize sellers taking the former ceiling quotations. With the promise that most price controls on agricultural products will be off by the end of the year, there would seem to be an understandable tendency for fat suppliers to hold on to their stocks.

The coconut oil market outlook is currently somewhat more encouraging, as June shipments from the Philippines reached figures approximating normal pre-war shipments. It seems questionable, however, that this rate can be maintained. A more lengthy consideration of the coconut oil market outlook appears elsewhere in this issue. (See page 39.)

Producers of heavy chemicals report that they are still far behind on deliveries, and that this situation may well continue for the balance of the year and perhaps through the first half of 1947. On many basic chemicals the supply shortage is currently more acute than at any time during the war years. Alkali production still lags behind demand with producers far back on shipments against contracts. Paradichlorbenzene is in the same position. The solvent situation has eased considerably, and spot shipments of carbon tetrachloride are now said to be obtainable.

On coaltar chemicals the picture has improved somewhat over recent weeks. Steel production, currently at approximately 90 per cent of capacity, is at the highest level since before the steel strike, and production of basic coaltar chemicals has shown a consequent increase. However, creosote oil, cresylic acid and phenol are still in short supply, and it will take producers some time to catch up with deliveries. Toluol and xylol were dropped in price by a major producer during the past few weeks.

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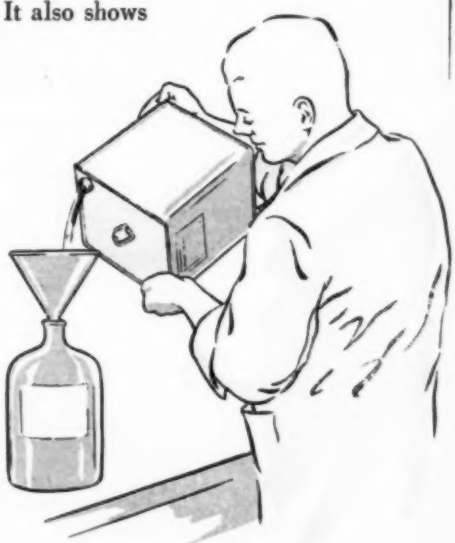
SPRAY manufacturers will find this pamphlet useful in selecting their insecticide perfumes and deodorants. It supplies — at a glance — all of the information needed by them to make a wise choice of odor masking agents based upon fragrance desired, limits of cost and type of toxicant or solvent employed. It also shows the percentage of deodorant suggested for each of the various insecticide types now in popular demand. Write us for a copy of this free pamphlet *today*.



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In the insecticide list, pyrethrum flowers continue in ample supply, and the rotenone situation now seems to be clearing up also. Fairly heavy arrivals have come in recently and additional quantities of rotenone are reported on the way to this market. By fall, the rotenone shortage should definitely be a thing of the past.

In the essential oil market, signs of weakness were apparent. The situation on bergamot oil remains competitive, and lower quotations are also noted on cassia, lavender flower oil and spike lavender.

Little encouragement is offered the aromatics industry from first hand reports on essential oil production in Java and Spain, according to the July market survey of the *Givaudanian*, monthly publication of Givaudan-Delawanna, Inc., New York. The government of Java has established a complete monopoly over all exports, with no exportation by private companies permitted. Most all essential-oil shipments are going to Amsterdam, where their resale is helping re-establish the war-torn Dutch economy, but shipments thus far have been very small.

During the Japanese occupation, the essential-oil plantations were neglected; all labor and land were utilized for the growing of food. The interior plantations may be in a slightly better position, since the Japanese confined themselves for the most part to the coastal areas, but political unrest in Java since the Dutch returned has made it difficult to get definite reports on that area. During the last few months a dribble of oil of citronella Java and oil of cananga have found their way to the Netherlands, but so far there have been no shipments at all of vertivert, palmarosa and patchouli.

The report from Spain declares that unfavorable weather conditions during the last three years have affected the production of all Spanish oils. The average production of oil of spike lavender has reached about 80 tons a year during this time, as compared to about 120 tons for a normal crop. This year there has been an abundance of rain in the mountainous districts, so production should be better, but fertilizers are still scarce and food at a premium in Spain, conditions which inevitably affect essential-oil crops. Labor costs have risen, and this will be reflected in the prices of the oils.

—— ♦ ——

Garfienkel Chem. Expands

Mr. Louis Garfienkel, president and director of the Garfienkel Chemical Company, New York, was recently elected president and director of the newly-organized Garfienkel Export Corporation. The new division will extend the company's contacts among western hemisphere buyers of aromatics, essential oils, perfumes, flavors, essences, and extracts.

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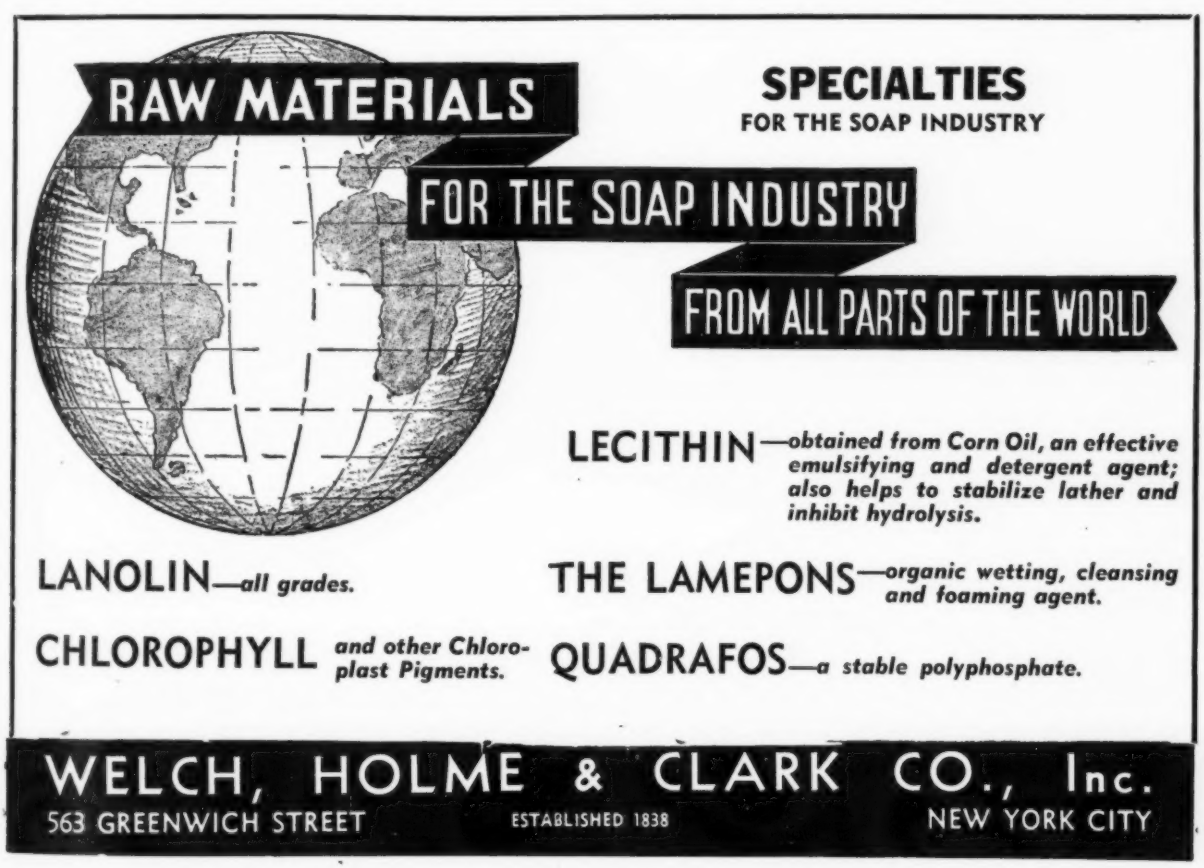
Cyril S. Kimball, vice-president of Foster D. Snell, Inc., Brooklyn, was recently elected by the Council in London as the American vice-president of the Society of the Chemical Industry.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FOR THE SOAP INDUSTRY
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SOLVAY

Countercurrent Soap Washing

SOAP boiling operations making use of three- and four-kettle countercurrent washing systems offer a definite advantage over individual wash and semi-countercurrent wash systems. The advantages are a smaller amount of spent soap lye, reduction in materials handling by eliminating pumping partly spent lyes back and forth between reaction kettles and storage, and reduction in steam costs through the use of atemperated charges rather than charges that have cooled down during storage. All of these advantages result in lower costs of labor, materials, and power.

A fact basic to counter current operation is that glycerine is distributed uniformly throughout the aqueous portion of the kettle. Furthermore in ordinary kettle practice, water and glycerine distribute themselves in fairly constant ratio in the soap and soap lye layers, the ratios varying somewhat depending on formulae and kettle practice. Therefore, by regulating the size of the soap lye wash with respect to curd, it is possible to remove a definite percentage of glycerol. The next step then is to set up systems of washes with regard to size, number, and countercurrent procedure so as to effect a definite percentage recovery of glycerine.

For purposes of control on such systems, it is important to measure the contents of the kettle during a boil by some means such as back-pressure liquid-level gauges of the manometer or dial type. An accuracy of plus or minus 2.0 per cent will afford adequate control.

In larger plants where countercurrent washing is used, kettles receive ten or more washes in a 24 hour day scheduled with short settling periods between washing. Glycerine recovery is approximately 95 per cent, and less than 1 pound of spent lye may be produced per pound of fresh fat charged to the kettle. In medium or small plants, where 24 hour schedules are impractical the system may still be used by employing about three large washes per kettle and by overnight settling.

Proper operation of the three-wash countercurrent system requires units of four kettles of equal capacity. The completed cycle requires eight days, one kettle being finished every second day producing a continuous supply of about 3.5 pounds of neat soap per day per cubic foot of kettle space of the unit. Each kettle is charged with fresh fat to an amount equal to 0.3 the gross water capacity of the kettle. The first kettle started in a unit cycle is supplied with a fat charge 15 per cent above normal to allow for the lack of an added niger. Washes are made up of fresh caustic lye, salt and water until washes are available from other kettles which are started each second day until all are in operation.

During continuous operation, the niger from a previous boil and the lye from change No. 2 in kettle D are used along with the fat charge for the new boil leading to change No. 1 in kettle A. Additional fresh caustic lye is added when needed. When properly grained with salt and allowed to settle overnight, the spent lye from change No. 1 in kettle A is sent to glycerine recovery and the curd is ready for change No. 2. Water is added to just "close" the soap which is agitated with steam and fresh caustic soda lye is slowly added to complete the saponification. When the change is completely saponified, soap lye of change No. 3 from kettle D is added and the charge is grained out with fresh caustic or dry salt and settled overnight. Change No. 3 is started by "closing" the grained curd with water and steam. The batch is boiled while in the closed state with a small additional amount of caustic to insure complete saponification, then a charge of niger is pumped into the batch in kettle A, and after boiling and building up the wash to the desired size, the batch is grained out with brine and/or caustic lye and allowed to settle overnight. The lye from this change No. 3 is then pumped over to kettle B for the second change on the latter kettle.

Change No. 4, "the fit," is then given to kettle A. The curd is boiled and the proper amount of water is gradually added to produce the type of "fit" desired. Roughly four to five pounds of water including condensate are required for every 100 pounds of normal curd soap to obtain a "medium" fit. When the proper fit has been obtained on kettle A, it is allowed to settle into two layers—neat soap and niger. After settling, the neat soap is pumped to processing or storage and the niger is boiled up and pumped to storage for reuse in change No. 3 of a future cycle. If excessively dark, it may be "pitched" to eliminate the darkest, poorest portion.

The countercurrent wash system described above may be varied to suit a three-kettle unit if the kettles are small enough to require less than two days settle after the fit. This unit is equal to the four-kettle unit in ease of operation and efficiency of glycerine re-

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covery and soluble impurity removal. In the three-kettle procedure, kettle A is charged with fat, and the lye from change No. 2 of kettle C is added. After change No. 1, the spent lye is discharged to glycerine recovery. For change No. 2, kettle A is charged with lye from change No. 3 of kettle C and its lye is sent to kettle B for change No. 1. For kettle A's change No. 3, niger and fresh lye are added and the settled lye is removed and used for change No. 2 of kettle B. Change No. 4 is the "fitting" change.

A comparison of the glycerine recovery at various poundages of spent lye per pound of fat charge shows the glycerine recovery by countercurrent washing to run about 10 per cent higher than the recovery by individual washing—each system using three washes.

Formulae are derived for the percentage recovery of glycerine in both systems. For the countercurrent system:

$$\% \text{ recovery} = 200L \frac{(0.9 - 0.9N + 1.4MN + 0.1M)}{2 - 2N + 2MN - 2M + 2LM + LMN}$$

For the individual system:

$$\% \text{ recovery} = 300 \frac{(L + M + N - LM - LN - MN + LMN)}{2 + L + M + N - LM - LN - MN + LMN}$$

where:

L = fraction of free glycerol in kettle removed by first wash.

M = fraction of free glycerol in kettle removed by second wash.

N = fraction of free glycerol in kettle removed by third wash.

The assumptions made are that the charge of fat is 90 per cent saponified on the first change, and that on the fitting change the free glycerol is divided between the niger soap and the neat soap layers in the ratio of one to two respectively. Five references. W. J. Govan, Jr., Wurster & Sanger, Inc., Chicago, *Oil & Soap 23* 229-235 (1946).

Interfacial Tensions

A comparison of the power of a special soap and of two synthetic detergents to lower the interfacial tension of the aqueous solution against paraffin oil was made by means of drop number determinations. The greater the drop number, the greater the surface activity of the compound and the greater the lowering of interfacial tension. Results were as follows:

1. Cyclohexanylamine oleate

Concentration in %	*Drop Number*
0.25	stream
0.125	stream
0.0625	stream
0.03175	92
0.0158	69

2. A highly sulfated oil

1.0	495
0.5	257
0.25	197
0.125	163
0.0625	137
0.03175	115
0.0	64

3. A secondary alkye sulfate

0.5	130
0.25	92
0.125	83
0.0625	68

Cyclohexylamine forms a readily soluble soap with oleic acid, giving an opalescent solution and a pH of 10.0-10.5. The 5 per cent solution does not gel on aging and is moderately stable on addition of sodium chloride. Under the test conditions the soap showed by far the greatest ability to lower interfacial tension, with the highly sulfated oil next and the secondary alkyl sulfate last. A. Carroll. *Manufacturing Chem.* 17, 140-3 (1946).

Solvent Extraction

The effect of heat on cottonseed oil miscella was studied in a practical approach to the problem of objectionable color fixation during heating and solvent-removal operations in the solvent extraction process. Heating of cottonseed-oil miscellas at various temperatures and for definite time periods under appropriate reduced pressures was carried out to determine the effect of heat on resulting oils.

Color fixation became objectionable between 150° and 180° F., and beyond 180° increased rapidly. Properly prepared solvent-extracted cottonseed oils from a prime lot of seed were successfully refined by slightly modified official A.O.C.S. refining methods which yielded oils of prime quality with low refining losses. The finished oils were equal in quality to high-grade hydraulic-pressed oils. Results gave the necessary engineering information for design and operation of pilot-plant equipment and for processing operations. Absorption spectra curves ranging through the visible and ultraviolet are reproduced as examples of applicability of this technique for studying solvent-extracted cottonseed oils. H. L. E. Vix, E. F. Pollard, J. J. Spadaro and E. A. Gastrock. *Ind. Eng. Chem.* 38, 635-42 (1946).

Oxidation Inhibitors

Agents which inhibit the oxidative deterioration of fats and oils such as certain phenolic and acidic substances, may be classified into two broad groups, antioxidants and synergists. The antioxidants are phenolic compounds which have a primary antioxygenic action. The synergists are usually di- and poly-basic acids which reinforce the effect of the phenolic compounds instead of acting directly. Thus benzoquinone and alpha-tocoquinone become powerful fat stabilizers in the presence of phosphoric acid, indicating that they are reduced to hydroquinone and alpha-tocopherol, respectively. It is evident that the subject of synergism is a very broad one and is still in its formative stages, but enough work has been done to show that it offers many opportunities of theoretical and practical interest. C. Golumbic. *Oil & Soap* 23, 184-6 1946).

Fatty Acid Removal

Free fatty acids and phosphatides can be removed from oils simultaneously by mixing soybean oil with furfural saturated with water. This gives different phases, one containing furfural, water and the fatty acids, another consisting of the vegetable oil with the phosphatides precipitated as a suspension. S. E. Freeman. U. S. Patent No. 2,390,528.

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The Army's Soap Problems

DURING World War II the Army bought many different kinds of products to do its cleaning operations, not all under specifications because of the lack of proper test methods. For the mobile laundries, synthetic detergents were used, originally an alkyl aryl sulfonate, but later any synthetic that could be obtained that would do the job. By July, 1945, three detergents were designated exclusively for this use. It is intended to revise the list of approved products from time to time.

During the Fall of 1942 the soap industry was requested to develop an all-purpose soap which could be used in all parts of the world in any type water. Washing a standard soiled-all-wool swatch was one of the guides used in testing these products. Field tests of some of the most promising all-purpose soap items were made at Camp Lee, Va., out of which a specification was written in 1943, and revised in 1944. It is still in effect. Two types of products are provided, framed and milled bars. The main objectives were 1. to limit the soap content to two parts of soap for one part of active-ingredient synthetic detergent; 2. use of a short-chain detergent for increasing lathering power; and 3. use of 10-30 per cent of coconut oil in the soap stock. The product finally developed did a good job for all things it was designed to do, according to reports sent back from all theaters of war.

Chipped and powdered soaps had to be stabilized against oxidation during storage, not only to prevent rancidity development but because of the danger of fire from spontaneous combustion. The three specifications finally adopted provide for minimizing the moisture content, a minimum of 4 per cent of sodium silicate, containers required not to be headed until temperature of the soap within the container is definitely decreasing and has reached a temperature below 100°F., a maximum limitation on the iodine number of the fatty acids, an exceedingly small maximum for copper, maximum of 2 per cent of rosin, and a requirement that the finished product contain a minimum of 0.1 per cent of an approved oxidation inhibitor. The latter may be diphenyl amine, ortho-diphenyl biguanidine, para-tertiary butyl phenol, or para-tertiary amyl phenol.

Peak requirements of GI soap reached 425 million pounds yearly. Although this yellow bar soap is not entirely satisfactory, the specification of May 1944 results in a reasonably satisfactory product.

Germicidal rinse is used in solution cold, after the washing operation and has helped to maintain clean mess gear, as well as to sterilize raw vegetables at times. Two formulations incorporate a chlorine-liberating compound with the proper oxidation potential to assure good sterilization, sufficiently stable for storage purposes.

The present specification for dishwashing products provides for a type to be used in water up to 120 p.p.m. of hardness, and a type to be used in harder water. Test methods are still under study with the intention of revising the present specification.

Four synthetic detergents for sea water laundering were approved after field tests at Camp Lee and on board a hospital ship, and a fifth as a satisfactory alternate. Three different kinds of standard soiled swatches were used in the small-scale tests and proved their value as a research aid in this work.

Many problems remain to be worked out, such as the correlation of physical and chemical tests with actual detergent performance, enhancing the soil-suspension qualities of synthetic detergents, cleaning clothing and equipment while maintaining military characteristics such as water– and flame-resistance etc., development of better dry-cleaners and oil removers, control of foaming power in accordance with type of use, and development of various types of equipment. J. E. Simpson. *Oil & Soap* **23,** 192-7 (1946).

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Phase Alteration in Soap

The alteration of phases in soaps and reversal of emulsions shows a relationship. To 100 cc. of triethylolamine oleate was added 19 cc. of paraffin oil. Increasing amounts of distilled water were added to this. With 5 cc. the solution became rigid, and with 50 cc. the emulsion was not resolvable under a microscope but had a honeycomb appearance, indicating heterogeneity. With 200 cc. of water the appearance was very creamy, but the emulsion was still water-in-oil. A very noticeable softening occurred at 220 cc. and when 240 cc. were added, the alteration occurred, producing an oil-in-water emulsion. On repeating the experiment with lower concentrations of soap in oil, alteration occurred again with 240 cc. of water. The concentration of soap in water at the point of reversal is 28.5 per cent.

In dilute solutions the volume of the disperse phase is 88 per cent of the total volume. The type of emulsion was determined for each preparation by adding a few grains of oil-soluble Sudan Red and examining under the microscope. The emulsions were prepared with the aid of an ordinary egg beater. The results demonstrate that the principle which determines the type of emulsion by the solubility of the emulsified component in one or the other phase can be applied to soap solutions. F. Lachampt. *Compt. rend.* **220,** 46-7; through *Chem. Abs.*

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Soap Stamping Machine

A simple safety device attached to a soap stamping machine acts so that if the operator releases pressure on the small hand lever, the pawl enters into engagement with the teeth and stops the press from descending any further. Such a device should be part of the fundamental design. *Soap, Perfumery & Cosmetics* **19,** 369 (1946).

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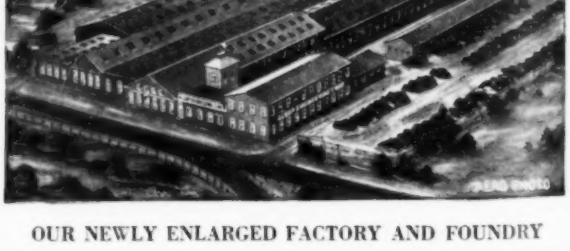

OUR NEWLY ENLARGED FACTORY AND FOUNDRY

PRODUCTION Clinic

By DR. E. G. THOMSSEN, PH.D

A NATIONAL scientific society recently polled its members on subject of improving professional status. Participants in the survey, were asked questions regarding the need for a proper definition of the profession, their attitude toward domestic and international affairs, beneficial legislation, state licensing of the profession and minimum salaries and standards. Members were also sounded out on their interest in possible unionization, exemption of union membership in closed shops by an amendment to the Wagner Act, as well as on organization of and publication of industrial relationships.

The results of the poll seemed to show that scientific men are not interested in being unionized, that they are interested in greater public recognition, in taking a greater interest in national and foreign affairs, and in having their publications devote greater attention to the members' professional problems. Incidentally the majority of members also seemed to show a decided interest in the establishment of professional codes of ethics under which members could be controlled and unethical practices punished.

The question of ethics among professional men, such as entomologists, bacteriologists, engineers, and chemists deserves considerable attention. Lawyers and medical doctors have for a long time had professional codes which they have zealously guarded, but professional men in industry have been notoriously lax in this respect, allowing frauds and pretenders to thrive under misrepresentation. These

pseudo-scientists, often lacking in formal technical training and experience, usually excel in salesmanship and psychology. By talking big and cashing in on some obscure university degree or discovery that is hard to verify and discredit, they exploit the uninitiated with their pin-point knowledge. Unfortunately these individuals are often found firmly entrenched in some organization, and as long as the gates are down, they will continue to come in. They are often more aggressive than the orthodoxly trained man and do not hesitate to take unfair advantage. Reputable men would obviously do well to turn greater attention toward the protection of their professions. A set of minimum qualifications might be drawn up for instance that would legally define an entomologist, bacteriologist, chemist, chemical engineer and other scientist. Coupled with a code of ethics under which unethical practices could be punished, and unethical members expelled, this would give added protection to reputable members of the profession.

Two flagrant examples of such pseudo-scientific fraud are cited. An experienced chemical engineer had planned a layout for a new branch plant. Another person was employed to supervise the installation. This so-termed "chemical engineer", was really a carpenter, feigning an education, but actually having gained his technical knowledge by working in a chemical plant for several years as a mechanic. He sold the owners on the idea that the prepared plans would be too costly if followed exactly. His method of installation, he stated, would save considerable and work more efficiently. He was permitted to make the changes, and shortly stepped up into the job of operating the plant. Operations were started under his direction and closed down in exactly five days, with pipe lines plugged, tanks overheated, raw materials spoiled, and the new plant in pretty much of a mess. The guilty individual merely walked out, having drawn a good salary for a period of months and gotten some additional experience as a plant manager which he could record and offer as evidence in getting himself another job. The grief, cost, and sweat of cleaning up the mess became the problem of others.

In another case, a prominent refugee scientist, who presumably had a wide reputation in Europe where he claimed to have held degrees from several universitites, was employed without consultation with technical heads. He was placed in a special laboratory and delegated to develop new products in a field in which he claimed proficiency. With the help of a few formulae from suppliers, dressed up with scientific hocum and supplemented with some simple ingredients under complicated names, this man succeeded in entrenching himself within the company to the point where he was eventually placed in charge of production of several important products. For a while he got by with the help of the practical men. Finally a problem came up requiring a simple chemical analysis which he did not even know how to run. The product was pack-

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aged and widely distributed. Its imperfections were so immediately evident that all of it had to be called in. Some of it was picked up by federal and state agents and substantial fines had to be paid, not to mention the loss of prestige and reputation suffered by the company in subsequent civil suits. The impostor merely quit his job and again those who remained behind had to suffer the consequences.

These two incidents are not uncommon. It is difficult for a reliable staff to contest such conditions. Laboratory men are not tale bearers. Their attitude is to give "bluffers" enough rope to hang themselves. This takes time and is often a costly procedure. If a code of ethics and qualifications were set up to define the profession, such individuals might hesitate to misrepresent themselves and find it difficult to become established. If penalties were attached to their actions, they could be made liable for their frauds instead of just walking away and in some cases repeating the offense unmolested in another direction. It is a constructive sign to find laboratory men interesting themselves in the solution of these troublesome questions. It is hoped that they will get action to elevate and protect their professions by instituting and enforcing codes of ethics to make it more easy to identify adequately qualified professional men.

New Processing Machine

The Cornell Machine Co., of New York, has announced a versatile new processing machine, known as the "Versator". This machine consists of a vacuum or pressure chamber in which a round open, tilted, disc-like, bowl revolves at high speed. Any material fed into the center of the disc or bowl forms a very thin film which flows out radially until it reaches minimum thickness and maximum velocity at the perimeter. The thus-formed turbulent film is practically "all surface" and the usual processes of vacuum, pressure, temperature and diffusional processes or radiation act efficiently upon it. The machine may be used for homogenizing, emulsifying, reversing emulsions, or de-aereating solutions, evaporating, dehydrating, impregnating, hydrogenating, oxidizing and for instantaneous continuous reactions. Its capacity is from 10 to 100 gallons per minute and power consumption up to 7½ H. P. The "Versator" is made of various metals. Information may be had by writing to the makers.

Hercules Catalog

Hercules Powder Co., Wilmington, has issued a new catalog, "Hercules Products", a very handy reference work to have around any plant. Hercules chemicals and industrial explosives are used by more than fifty industries. The products are described under various headings into which they fall like the cellulose family, the rosin family, synthetic resins, terpenes, special products and others. Each item is described briefly as to properties and uses. An end-use index is included in which the products are listed under the various industries where they find use, such as adhesives, essential oils, insecticides, soaps, etc.

Carnauba Wax Substitutes

Numerous inquiries come in regarding the efficacy of carnauba wax substitutes, in view of the high price and scarcity of this wax, for making liquid waxes. As many of these substitutes are untried and often produce tacky, dark, unsatisfactory products, unless careful investigation of their use is pursued, it is good policy to make haste slowly. Improvements in these substitutes are being made constantly and before many months the demand for an entirely satisfactory substitute should be met. Purveyors of these synthetic waxes are helpful, and we dare say when normal conditions return, carnauba wax will have lost much of the market for liquid floor waxes.

Handy Adhesive

U. S. Plywood Corp., New York, has issued an interesting bulletin regarding "Pliobond", a new, remarkably versatile adhesive. This product joins many materials easily and permanently. Materials like glass, steel, aluminum, plastics and textiles may be perfectly bonded together. Unusually high temperature or pressure are not necessary. "Pliobond" comes ready for use and consists of a one-part bonding agent eliminating the necessity of making up mixtures. This new adhesive is strong, permanent, withstands flexing, sets quickly, is not affected by fungi, and resists water, oil and wax. Anyone interested may obtain technical information as to its use by writing the Industrial Adhesives Division of this company.

New Vacuum Filler

The U. S. Bottlers' semi-automatic vacuum filler has been redesigned to provide for new and improved construction. The U. S. vacuum filling principle makes the unit entirely automatic for continuous filling, while a simple hand operation moves containers conveniently at the filling speed. The filler is adequate for major filling operation in a plant of average capacity and, as it is portable and applicable to most any liquid or container, the unit is useful for auxiliary all-around work during peak loads in plants of large capacity. A bulletin describing the new model is now available upon request for, "Bulletin B-2", mailed to U. S. Bottlers' Machinery Co., Chicago, 18, Ill.

New Ketone Booklet

A new booklet just published discusses the physical and chemical properties of ten commercially important ketones produced by Carbide and Carbon Chemicals Corp., New York. Specifications and shipping data are given in this booklet, as well as information regarding principal uses for the products. The booklet further discusses the uses of ketones as important intermediates in the synthesis of industrial chemicals and their high solvency for nitrocellulose and "Vinylite" resins. Their uses are discussed in the extraction of drugs, stripping of dyestuffs from textiles, coagulation of rubber latex, and dewaxing of lubricating oils. The booklet may be obtained from Carbide and Carbon Chemicals Corp. Ask for Form 4767.

New Bubble Blower Design

Following the introduction a year or so ago of bubble blowers and bubble-forming solutions, H. M. Harvey, The Mill End Store, Orangeburg, S. C., has done some special work in designing a new type blower for these

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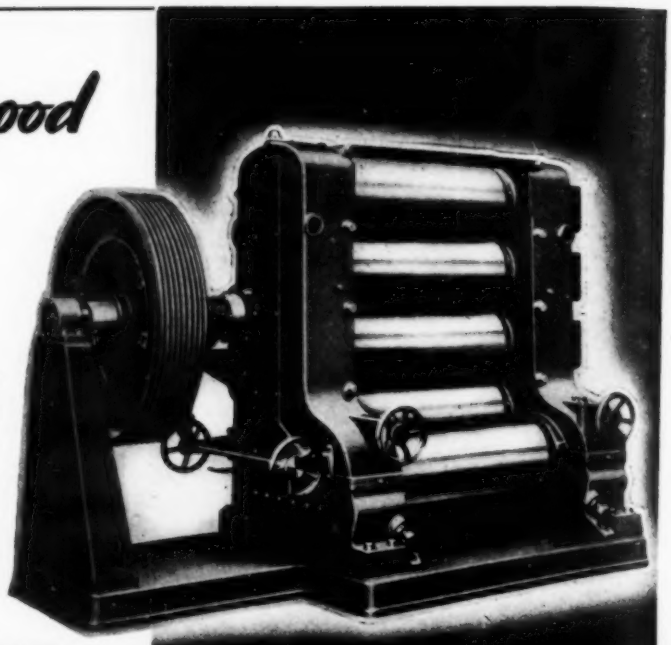

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Be not like the stream that brawls
Loud with shallow waterfalls,
But in quiet self control
Link together Soul with Soul
Longfellow

When from the censor clouds of fragrance roll
And swelling organs lift the rising soul
One thought of thee puts all the pomp to flight
Priests, tapers, temples swim before my sight.
Alexander Pope

solutions. The new blower is unique in that it features an arrangement by which one can pause at any time desired for a fresh breath of air and then continue to blow a steady stream of bubbles. The inventor has no plans for marketing the device and wishes to market it through some other interested party.

MCA Issues Manual

The publication of a chemical safety data sheet, SD-3, on carbon tetrachloride is announced by the Manufacturing Chemists' Association, 608 Woodward Building, Washington 5, D. C. The manual sets forth the important physical and chemical properties of this product; usual shipping containers, and methods for their unloading and emptying; container storing and handling; requirements for caution labels; and recommended personal protective equipment. Health hazards and their control are covered in a section prepared by the Medical Advisory Committee. Copies of the manual can be procured at 20 cents each from the Association.

New Bowser Pumps

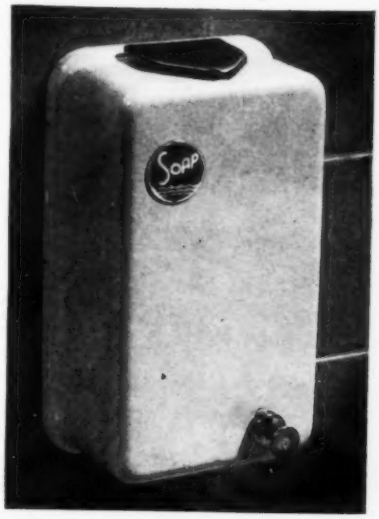
Bowser, Inc., has recently announced that a complete line of pumps will be developed for general industrial and petroleum product applications. A new industrial pump division of the company will be located at Fort Wayne, Indiana and headed by J. B. Trotman. Mr. Trotman has been identified with the pump industry for thirty years and has been for the past six years general sales manager of Blackmer Pump Co., Grand Rapids.

Fibre Cans Described

Fibrcan Corp., Whitestone, N. Y., have prepared a folder describing their fibre receptacles of various sizes, steel reinforced, for refuse disposal. The company puts out both tapered and round straight types in dark brown color, made of case-hardened fibre with seamless steel spun rims and metal bottoms. There is a mobile type mounted on four rubber wheels. Copies of the folder will be mailed upon request addressed to the company.

Conseco Evaporator Folder

A new catalog illustrating the Conseco line of low pressure evaporators and distillers for various industrial and marine uses was issued in July by the Condenser Service and Engineering Co., Inc., Hoboken, N. J. The catalog discusses the advantages and economies of low pressure evaporation, and gives installation diagrams and cost data.



New Soap Dispenser

Bobrick Manufacturing Corp., Los Angeles, has recently introduced a new powdered soap dispenser. Made of heavy guage steel with a white baked-enamel finish, this unit has a full one quart capacity and delivers a measured quantity of any powdered or small flake soap at each press of the plunger. An agitator spring prevents caking and assures even delivery. The unit illustrated is built to insure against corrosion with any type soap and is being produced in both commercial and home models.

Increased Amine Output

Expanded facilities for the production of the three isopropanolamines —mono-, di-, and tri-isopropanolamine, have recently been completed by the Carbide and Carbon Chemicals Corp., New York. These amines are used as emulsifying agents and as sources for making synthetic detergents and producing pharmaceuticals. They are finding increasing application in the formulation of cosmetic creams and emulsions, as the soaps of the isopropanolamines are excellent emulsifying agents that are resistant to darkening under normal storage conditions.

Hospital Laundry Survey

Data compiled in a recent survey by *Hospital Management* indicates that more than three-fourths of all hospitals operate their own power laundries. According to the 419 questionnaires returned by hospital administrators, 320 hospitals operate power laundries, 19 operate hand laundries, 6 handle part of their laundry work in hand laundries, and 72 do not have a laundry. The laundries employ an average of 17 persons each.

In New Sales Post

J. D. Mattern has been named assistant director of sales of the Diamond Alkali Company, Pittsburgh.

CSA Issues Booklet

In connection with its 25th anniversary, the Salesmen's Association of the American Chemical Industry, recently distributed to its members a booklet listing the members of the Association, its constitution and by-laws, past presidents, honorary members and committees and their members.

Kellogg Copra Plant

Work has begun on the construction of two additions to the copra processing plant of Spencer Kellogg and Sons Corporation, Long Beach, Calif. The new construction consists of a cake storage and grinding building and a scale house. The buildings are being constructed by the James Stewart Corporation of Chicago.

Patent Lawyer Returns

Lt. Col. Harry Price, having served in the Office of the Chief of Ordnance in Washington and in the Army Air Forces in Europe is now resuming the practice of patent and trademark law in association with Dean, Fairbank & Hirsch, Suite 2618, Graybar Bldg., 420 Lexington Ave., New York, 17, N Y.

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PRODUCTS AND PROCESSES

Fine Soap Powder

A colored, perfumed, fine soap powder having lasting suds and suitable for washing delicate items is made from an emulsion of 9 ounces of soap and 24 fluid ounces of cold water, to which 24 fluid ounces of water at 180°F. is added. The mixture is heated to 65°, color and perfume are added, and the mixture is beaten slowly to a colored frothiness, more rapidly until it assumes a roll appearance, then more slowly until the mass shows a pattern like pie crust. It is dried by air exposure and reduced to a fine powder. E. A. Westerberg. U. S. Patent No. 2,390,906.

Crude Tall Oil Soap

Crude tall-oil soap is separated into its constituents by selective extraction using ketones of low molecular weight and a hydrocarbon such as heptane, as solvents. Depending on the solvent system chosen the following products are obtained in varying proportions: fatty acids, oxidized rosin, hexane-soluble abietic acid, hexane-insoluble rosin acid, sodium soap of rosin pitch, and sterols. A detailed flow sheet is given. J. J. Lovas and P. F. Bruins. U. S. Patent No. 2,395,282.

Colored Designs on Soap

A provisional specification preceding the complete specification to British Patent No. 574,291, granted to H. F. Slack and the Dubarry Perfumery Co., permits a soap cake to be prepared in two or more colors. One form is to produce the soap in such a way as to suggest that a cameo has been inserted in the center. The soap cake is first stamped in the usual way but with a punch or die provided with a cylindrical projection, say 2 inches in diameter and ½ inch in depth, so that when the soap tablet is removed from the mold, a corresponding recess is left. In this recess is placed and secured by adhesive or by water, a second soap tablet of different color, having the same dimensions as the recess provided. The second tablet may or may not have a design stamped on it, such as that of a woman,s head, of a flower, or of lettering. Silhouette effects may also be produced. *Perfumery & Essen. Oil Record* 37, 107-8, 114 (1946).

Use of Synthetic Acids

Synthetic fatty acids may be used to produce various types of soap. For example, an emulsion of 25 parts of synthetic fatty acids from a previous run, 15 of beef tallow fatty acids, 0.3 of potassium stearate, and 0.25 parts of potassium permanganate in 50 parts of hot water, was prepared. Half of it was added, along with three parts of zinc stearate, to 600 parts of paraffin at 110°C. Air containing 0.2 per cent of moisture was blown through at 125°C. until the saponification number became 100. The other half of the emulsion and another three parts of zinc stearate were added, and blowing and heating continued until a saponification number of 180-200 was reached.

On cooling, the middle liquid layer of synthetic fatty acids was separated from the upper white solid layer of unsaponifiable matter, and a lower brownish layer of catalyst residues. The synthetic fatty acids were almost white, odorless, contained 6 per cent of unsaponifiable matter, and had a saponification number of 200.

In a cold-process soap, a 20 per cent soda ash solution was added with thorough stirring to neutralize 1000 parts of molten synthetic fatty acids. A 25 per cent solution of filler material containing 10 parts of sodium silicate, 10 of sodium perborate, and 10 of potash, was crutched into the soap. The soap was cooled and spray or drum-dried.

For semiboiled soap, a molten mixture of equal parts of synthetic and beef tallow fatty acids was neutralized by pouring with stirring into 20 per cent soda ash solution at 60-70°C. For a marine soap, a 20 per cent solution of caustic soda-potassium carbonate in a ratio of 2:1, was poured into molten synthetic fatty acids and the temperature was raised to complete the saponification. A 25 per cent solution of filler material containing 10 per cent of sodium silicate, 5 of potash, and 10 of sodium perborate, was crutched into the soap. It was then cooled and dried. S. Hirsch, to Cargill, Inc. U. S. Patent No. 2,391,019.

Tall Oil Soap

. Soaps formed from a mixture of tall oil and fatty acids are relatively stable, light in color, odorless, very soluble, nonsticky, and have a low sensitivity to graining and jelling. A small amount of phosphatides improves the detergent properties.

The oil to be refined and the alkali are mixed in controlled proportions and pumped into a mixing device where gums and phosphatides are precipitated. The oil and soap stock are heated to vaporize water and impurities. The mixture is then discharged into a vacuum dehydration chamber. A mixture of rehydrating agent such as tall oil or naphthenic acid soap, and the dehydrated oil and soapstock, at 100-250°F., is centrifuged to produce and separate a refined oil and a soapstock which are further purified. The refined soapstock, in the form of molten anhydrous soap, is withdrawn in a screw conveyor and milled or plodded as a solidified soap. B. Clayton, to Refining, Uninc. U. S. Patent No. 2,390,990.

Lettering on Soap

In provisional British Patent No. 2322 granted to George Cole, lettering on soap is made by a die which goes into the soap cake to nearly half its thickness. As soap is washed away from the surface layer the lettering still remains because of its depth. Should any soap be washed into the gaps formed by the lettering, the difference in texture of the soap in the gaps will still show up the original lettering. Such lettering may be made on both sides or on one side of the cake only. *Perfumery & Essen. Oil* Record 37, 107 (1946).

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Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel. Any inquiries relating to Patent or Trade-Mark Law will also be freely answered by these attorneys.

No. 2,401,028, Mildewproofing of Textile Materials, patented May 28, 1946 by William P. ter Horst, Pompton Plains, N. J., assignor to United States Rubber Co., New York. The method of mildewproofing textile material which comprises treating said textile material with phenanthraquinone- 9,10 in amount effective to control mildew.

No. 2,401,726, Detergent Composition, patented June 11, 1946 by Lawrence H. Flett and Gilbert C. Toone, Hamburg, N. Y., assignors to Allied Chemical & Dye Corp., New York. A detergent composition useful as a shampoo comprising an alkali metal salt of a long-chain monoalkyl ester of sulfuric acid containing 12 to 18 carbon atoms in the alkyl radical thereof, and for each part by weight of said salt, one-half to four parts by weight of a stabilizing agent composed of at least one compound which is a water-soluble salt of a monoalkyl ester of sulfoacetic acid containing 5 to 11 carbon atoms, but not more than 9 carbon atoms in a straight chain in the alkyl radical thereof.

No. 2,401,756, Continuous Soap Process, patented June 11, 1946 by James K. Gunther, Hinsdale, Ill., assignor to Industrial Patents Corp., Chicago. In a process for the manufacture of soap, the step which comprises reacting a saponifiable material with an aqueous solution of a saponifiable material with an aqueous solution of a saponifying reagent in the presence of a relatively large amount of inert organic diluent having solvent properties for the saponifiable material, the amount of water in said aqueous solution being insufficient to precipitate the soap and said inert diluent being present in a sufficient amount to render the reaction mixture flowable and to enable the saponification reaction to be carried out below a temperature at which the soap would be molten when the volatile matter is removed.

No. 2,402,473, Soap Composition, patented June 18, 1946 by Benjamin S. Van Zile, Wilmington, Del., assignor to Hercules Powder Co., Wilmington. A salt-water soap composition, comprising on a dry weight basis from about 45 per cent to about 75 per cent of an alkali metal water-soluble soap of fatty acids having a titer between about 25°C. and about 48°C., from about 5 per cent to about 30 per cent of a water-soluble resinate selected from the group consisting of alkali metal resinates and ammonium resinates, and from about 20 per cent to about 45 per cent of an alkaline water-soluble inorganic salt, at least one-half of said salt being a polyphosphate of an alkali metal, said soap composition being characterized by high detersive and foaming properties in sea water.

No. 2,402,557, Glass Solution Inhibiting, patented June 25, 1946 by Herbert Kranich, Brooklyn. The method of preventing undesirable cloudiness in water solutions of potassium soaps contained in glass vessels which consists in adding between 2.0 per cent to 0.07 per cent of commercial sodium silicate to the liquid soap, then heating to at least 70°C., allowing to stand for about one week, then cooling to about 4°C., and then filtering.

No. 2,402,657, Detergent Composition, patented June 25, 1946 by Magnus J. Myres, United States Army, Mexia, Tex. The process for the preparation of a detergent composition non-irritating to skin and characterized by having a flash point not lower than 115°-120°F. which comprises mixing five gallons of kerosene and one-fourth pound of anhydrous caustic soda, heating the mixture to a temperature of approximately 200°F. for a period of two hours.

No. 2,402,896, Insecticide, patented June 25, 1946 by Theodore W. Kerr, Jr., Seymour, Conn., assignor to United States Rubber Co., New York. An insecticidal composition containing 2,2-bis(p-chlorophenyl)-1,1,1 - trichloroethane and an oily distillation product of the condensation product of monochlorobenzene with ethylene dichloride.

SILVER POLISHES

(*From Page 45*)

num foil; the soda dissolving in the water to form the electrolyte and the foil serving as the electronegative contact metal in the silver cleaning bath.

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Proper floor maintenance not only reduces mill accidents but also increases plant efficiency. The life of hard-to-get maple flooring can be prolonged by dry-cleaning methods which give the floor a hard finish and avoid the use of soap and water. A new attachment which removes traveler rings from mill floors has been demonstrated. The renovated floor area is treated with a special sealing solution and then burnished with steel wool, leaving a hard surface resistant to penetration. *Textile World* **96**, No. 5, 150 (1946).

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CREAM SHAMPOOS

(*From Page 48*)

jars. "Silver Seal Homogenized Shampoo," is sold in gallon containers to beauty operators. "Lustre Creme" and "Select" are good sellers on the retail market. Both are of the paste type. "Glamour-Tone" is a cream shampoo of the paste type sold to operators in 16 oz. jars and in larger containers. "Helen Curtis Creme Shampoo" is of the cream type and "Helen Curtis Milky Shampoo," and "Milky Fluff" are liquid products sold to the wholesale trade. "Halliwell Cream Shampoo" is a cream shampoo sold to beauty operators. Two new products recently announced are, "Marabou," put out by Covray, Inc. New York and "Studio Girl Creme Shampoo" for dry hair.

There are still a number of problems which seem not to have been solved by all manufacturers of cream shampoos. The milky types are hard to keep in suspension at temperatures up to 100°F. and they tend to become translucent. The soap content must not be so high as to cause a gel on cooling. Many manufacturers have experienced difficulty with stability and uniformity of these milky types of lower viscocity. In some cases, these troubles have been largely overcome by reducing the partical size of the emulsion or increasing interfacial areas by homogenization, or by the use of the colloid mill. The efficiency of some of the paste types high in soap content is questioned. Those that are formulated from higher melting-point fats have less detergency and rinseability, and must be complemented with synthetics. The synthetics offering unstable, flash, foams are to be avoided. Care must be taken to formulate an "all year" product that will be chill-proof and not too thick in the winter, and still not be too thin and tend to separate if kept in a warm place.

Those who are using synthetic surface-active chemical agents in their cream shampoos to replace soap ingredients still on quota should be aware that the extension of the WFO 42b order includes these synthetic detergents under the definition of soap and places them on quota along with the soaps. However, it seems that if you merely perfume and color such an agent, and add nothing else, you may sell it as a shampoo and avoid the order by not being classified as a "manufacturer" or as a "converter."

There are a few agents with both emulsifying and detergent properties that have the form, stability, and mildness to be used alone as a shampoo cream. According to de Navarre, sodium coconut oil alcohol sulfate paste, a product so used, is not very satisfactory at temperatures above 80°C.

PHOSPHATES IN SOAP

(*From Page 49*)

small amount of TSP to the water used in the dissolving or diluting process will help in clarifying the finished solution as the unsaponified fatty acids will be combined. It will also tend to add a water softening character by the formation of TSPP in the solution.

An additional advantage is the mildness of the resulting soap, a particular point of merit when soaps like wall-washing soaps are being made.

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New Definitions in WFO 42-b

In addition to the changes noted last month in the War Food Order 42-b as a result of the issuance of amendment 10, there are a number of new definitions included in the new amended version. The principal changes are in the definitions of "soap converter", "soaps", "soap detergents"; and the addition of a new definition for "synthetic detergents". These definitions now read as follows:

"Soap converter" means any person who uses soap made by others as a raw material and, by the addition of other materials or ingredients, makes a finished product which is sold for detergent purposes. The term 'soap converter' shall not include persons who merely add small amounts of color or perfume to the original soap, or who merely dissolve paste or other soaps in water to make liquid soaps."

"Soap" means the water-soluble product formed by the saponification or neutralization of fats, oils, or their fatty acids with organic, sodium or potassium bases; or any composition containing such products, including all types of shaving cream and shaving soap, and including synthetic detergents made from fats and oils or other derivatives."

"Synthetic detergents" means any water-soluble, surface-active organic material possessing detergent and wetting properties which are retained in aqueous solution of calcium or magnesium chloride."

The new amended version of WFO 42-b has not changed quotas for the use of fats and oils in soap.

—— ♦ ——

Colloidal Electrolytes

In a study of colloidal electrolytes, the freezing point, conductivity, viscosity, and transport data were determined for aqueous solutions of hexanolamine oleate. Small micelles are shown to exist which contribute very little to the lowering of freezing point but which have a substantial conductivity. The cationic transport number is found to be negative and that for the oleate radical is greater than unity at moderate concentrations, a further demonstration of the presence of conducting micelles, which must moreover, include hexanolammonium ions. E. Gonick and J. W. McBain, *J. Colloid Sci.* 1, 127-35 (1946).

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Low Pressure Studies

Experimental vapor-liquid equilibrium data were obtained with a mixture of methyl esters, and a mixture of fatty acid and the corresponding methyl ester. The figures obtained were in agreement with data calculated from Raoult's law at a low pressure of 4 mm. of mercury.

The system lauric acid-myristic acid was non-ideal, not obeying Raoult's law at the same low pressure. An average rate of polymer formation of 0.23 per cent per hour at 155-170°C. was determined for mixtures of lauric acid and myristic acid. J. A. Monick, H. D. Allen, and C. J. Arlies. *Oil & Soap* 23, 177-82 (1946).

Skin Irritation of Soap

The irritant properties of mixtures of soaps from two fatty acids were studied. Sodium laurate-sodium caprylate mixtures appear to be highly irritant to the skin of both sexes. Sodium ricinoleate binary mixtures with sodium laurate, caprylate, and oleate show a definite irritant action. Sodium linoleate binary mixtures with sodium laurate, caprylate, and oleate indicate a lesser degree of irritant action. Sodium laurate-sodium myristate binary mixtures tend to be much less irritant than can be predicted from their individual irritant powers. M. S. McKinney and L. D. Edwards. *Oil & Soap* 23, 198-200 (1946).

Four-Stage Hydrolysis

In a four-stage process the yield in fat hydrolysis is raised to about 95 per cent by using a contact agent of molecular weight 300 and 1.7-2.3 per cent sulfuric acid. The stages are: (1) With 0.7-0.9 per cent of contact agent hydrolyze the fat with 40 per cent of its weight of 6-7 per cent glycerine liquor from the second stage, by boiling nine hours to at least 80 per cent hydrolysis. The yield of glycerine liquor is 48-50 per cent as calculated on the fat. (2) With 0.4 per cent of contact agent, add wash water from the 4th stage to 35 per cent calculated on the fat; boil six hours and obtain at least 89 per cent hydrolysis. (3) With 0.2 per cent of contact agent and condensate 19 per cent based on the fat, boil four hours and obtain hydrolysis of at least 93.5 per cent. (4) Wash with 10 per cent of condensate, calculated on the fat. Hydrolysis is calculated on oleic acid. The amount of water is an influential factor. The method has been used with coconut and palm oil. M. S. Levit. *Pishchevaya Prom.* 1945, No. 2, 42-6; through *Chem. Abs.*

Efficiency of Wetting Agents

Surface tension measurements at pH 3.7 were made with the maximum-bubble pressure and ring methods. Maximum bubble pressure was found unsuitable for measurement of surface tension of solutions showing a variation with time. Solutions having surface-tension values less than 37 dynes per cm. were considered good wetting agents. By this standard "Surfax," "Igepon T," "Gardinol C.A.," and "Ultrawon WX" are very efficient. "Nekal BX" is less so and "Diazopon A," "Silvatol I," and Turkey red oil are inefficient. Bivalent ions are more effective than univalent in increasing the wetting power of "Nekal BX." T. Krishnappa, K. S. G. Doss, and B. S. Rao. *Proc. Indian Acad. Sci.* 23A, No. 1, 1-7 (1946); through *Chem. Abs.*

Soap Micelles

The spacing in soap micelles as measured by x-ray diffraction was studied with hydrocarbons dissolved in aqueous solutions of potassium laurate for oil-saturated systems. Polymeric molecules cannot be held by soap micelles. When 0.75 gram of styrene was polymerized in a solution with 100 grams of 6-21 per cent potassium laurate, a transparent latex was obtained in which the particles were below 100 Angstrom units in diameter. When the soap concentration was 0.2 per cent, which is below the critical concentration for micelles, the same amount of monomer gave a turbid, nontransparent latex. W. D. Harkins, R. W. Mattoon, and M. L. Corrin. *J. Colloid Sci.* 1, 105-26 (1946).

Germany's Soap Ration

All that the ordinary German consumer can obtain today for four weeks' use is either a piece of low-grade household soap weighing a little over ½ ounce, which is aerated and so floats, or a piece weighing 2½ ounces containing the same quantity of pure soap but heavily adulterated with clay, plus a little less than 4½ ounces of a very inferior soap powder and the same quantity of water-softening and bleaching powder which contains no soap at all. Both these powders have a high proportion of soda ash or other chemicals. Small amounts of supplementary rations are also provided, as for small children, miners, doctors, to men for shaving, etc. Even with these, the average German is provided with only 15 per cent of the soap obtainable per person in England today. *Soap, Perfumery & Cosmetics* 19, 358-9 (1946).

Laundry Blue

Blueing does not whiten fabrics but neutralizes the yellow. If the goods are off-color in the direction of gray rather than yellow—a condition often encountered in hard-water plants—blueing may simply aggravate the condition. Insoluble blue pigments have been largely replaced by soluble blues which are much more satisfactory. Soluble blues, principally derivatives of aniline dyes, are of three kinds—sour, non-sour, and combination. Sour blue should be used only on previously soured loads, and non-sour on loads which have not been soured; combination blue may be used on any load.

Since blueing is a tinting or surface-dyeing operation, temperature and concentration must be carefully controlled for the best results. To avoid spotting, streaking and unevenness, the stock blue solution should be diluted with water before being added to the washwheel. *Laundry & Dry Cleaning J. of Canada*, April, 1946.

Mutual Solubilization

Soap has a great solubilizing effect in making organic liquids such as glycols miscible with hydrocarbon solvents and their chlorinated derivatives. The soap becomes highly soluble in the mixture even if it is only slightly soluble in one or both of the solvents separately. Blending is illustrated with diagrams and data for soaps with propylene glycol and benzene. Methyl alcohol and cyclohexane show similar behavior. Potassium and sodium stearate soaps are even more powerful blenders than sodium oleate. Twelve per cent sodium oleate suffices to make benzene and propylene glycol miscible in all proportions at room temperature. S. R. Palit and J. W. McBain. *Ind. Eng. Chem.* 38, 741-4 (1946).

Alcoholysis of Oils

Natural oils are treated at room temperature in the presence of hydrochloric acid with 1.5-3 equivalents of an alcohol having less than 6 carbon atoms. V. Wolf Ltd. and R. Rosenbusch. British Patent No. 563,481.

SANITARY PRODUCTS

A SECTION OF SOAP

THE manner in which some of the newspaper headlines tried to hang the two recent tragic mid-west hotel fires on DDT insecticides would be amusing were it not serious. "Warns that DDT may cause flash fires." This was the headline on a front page story in the Des Moines Register covering the investigation of the Dubuque hotel fire. In the body of the article, mention was made of the fact that DDT is applied in liquid petroleum solvents which are flammable. No mention is made of the fact that these solvents evaporate shortly after application, that the fire hazard is short lived, if any, or that the quantity applied to any area is extremely small. Nor is any mention made that insect sprays for over twenty years have been made with a base of these same types of petroleum solvents.

Off hand, it would appear that somebody is using DDT insecticides as a red herring to divert attention from any real negligence which might have existed in both or either the Dubuque or Chicago fires. Actually, as anybody with even a smattering of knowledge of DDT insecticides knows, the DDT could have had about as much to do with either fire as the man in the moon.

THE American public is notorious in its refusal to read direction for use on package labels. Inasmuch as most insecticide manufacturers are now marketing two or more kinds of insect spray, this public quirk can add up to trouble for the manufacturer. It may mean misuse, poor results, and an unjustified condemnation of the product as so often has happened in the past. At the present time, the NAIDM is engaged through cooperative advertising in urging industrial and institutional users to "read the directions." The manufacturer of small package products might do well right now to follow suit with label stickers, tags and the like. The chances of misuse, greater today than ever, might be considerably reduced.

A DRIVE by health authorities in New York City to clean up dirty restaurants, bars, grills and lunch counters, accompanied by stiff fines against offenders, brings to the front again the subject of dirty dishes and eating utensils as potential spreaders of infectious disease. It also brings up the need for some means to minimize this hazard beside the usual health requirement that dishes be washed "clean" and rinsed. Our observations over a period of years are that this requirement is met more in theory than in practice especially in smaller establishments.

The mandatory use of germicidal detergents or rinses in public eating places is on its face far from a perfect solution of the problem. Leading law enforcement officials have always maintained that such laws do not work, that they add merely another unenforceable law to those already on the books, and that present sanitary laws are adequate if they could be and were enforced. But in spite of these expert opinions, there are many who maintain that with the right kind of law and enforcement, plus education and publicity, mandatory disinfection of eating utensils in public places might be a genuine aid in reducing the disease hazard. A five-year trial in a few large cities might find the answer.

SANITIZING DISHES*

Washing of dishes and glassware is a never-ending problem for the soda fountain, — and a task that seldom gets the time and attention it merits. New York City is currently checking on dish sanitization, and handing out stiff fines to violators of the sanitary code.

By W. L. Mallman and Edgar W. Kivela
Michigan Agricultural Experiment Station
and Gray Turner
Lansing (Mich.) Department of Health

IN 1936 Mallmann and Devereux (1) demonstrated that restaurant utensils were frequently laden with bacteria, and that by the institution of proper sanitary precautions it was possible to obtain utensils with bacteria counts under a 100 per unit. They proposed a technic of swabbing to determine bacterial populations on utensil surfaces. They also demonstrated that streptococci were found on used beverage glasses, and that after improper washing, glasses still carried sterptococci. Lyons (2) demonstrated the presence of mouth spirochetes on both used and improperly washed beverage glasses. These studies and numerous later papers by others have demonstrated the need for proper cleaning and sanitization of beverage glasses and restaurant utensils to eliminate health hazard.

The writers are agreed that the best method of rendering utensils free of health hazard is the application of hot water at 170°F. for two minutes in hand operation or by machine for 10 seconds.† However there are many conditions where hot water is inapplicable and chemical sanitization is necessary.

For many years the senior author has recommended that hypochlorites be used because these compounds were the only chemical agents applicable to glass sanitization that had sufficient speed to accomplish satisfactory results. It has been recommended that glasses be immersed in a hypochlorite solution of a concentration of 200 p.p.m. available chlorine for two minutes. The senior author was of the opinion that effective sanitization was effected in 15 seconds under ideal conditions, but believed that an exposure of two minutes should be required, or that the glass should be dipped into the hypochlorite solution and allowed to drain for at least two minutes before use.

In the Lansing area after a period of years of routine use, the writers were satisfied that effective re-

* Before Natl. Assn. Insecticide & Disinfectant Mfrs., French Lick., Ind., June 18, 1946.
† Unpublished data by senior author.

sults could be and were attained by the use of hypochlorite sanitization. However it has been necessary to maintain continuous supervision because operators have objected to the taste and odor of hypochlorites which is imparted to the glasses. Laboratory tests and field demonstrations have proven definitely that neither taste nor odor results if proper procedures are used. However, the operators are unconvinced, and evasion of the use of hypochlorite sanitization is frequent.

A survey was made in the Lansing area to determine the degree of compliance to the requirement that all beverage glasses be rinsed in hypochlorite solution. It was found that many places never used chlorine and that many by-passed the chlorine tank. The difficulty of obtaining good sanitization wherever operators are required to use compounds to which they object is easily seen. We have kept to chlorine sanitization purely for the reason that there were no other methods of glass sanitization which were satisfactory.

A search has continued over a long period of time to find compounds that would have no odor or taste objection, and still would do a satisfactory job for cold sanitization. Many chemical agents have been tested but have been found to be unsatisfactory, particularly because they were too slow acting. More recently we have been interested in the quaternary ammonium compounds because they appeared to have high killing value and no odor or taste in use dilution. This paper will be devoted largely to studies on these compounds.

The laboratory findings on these compounds have been extremely interesting, particularly as they pertain to measurements of effectiveness by the use of the F.D.A. technic. These studies have been largely confined to three products, "Roccal," "B.T.C." and "Hyamine 1622," and since they behave very much the same, no attempt will be made to designate the product used. For the sake of brevity, these products will be referred to as "cationics." All dilutions referred to are based on a 100 per cent concentration. In all studies 10 per cent solutions were used.

TABLE 1
The germicidal action of a cationic on *Staph. aureus* using the Use-dilution technic

	Time of exposure in minutes							
	1		5		10		30	
Dilution of cationic	*growth in broth*	*bacteria count*	*growth in broth*	*bacteria count*	*growth in broth*	*bacteria count*	*growth in broth*	*bacteria count*
1-1000	+	220	+	10	—	0	—	0
1-1000	+	30	—	0	—	0	—	0
1-2000	+	3700	+	0	—	0	—	0
1-2000	+	3500	+	80	—	10	—	0
1-4000	+	6200	+	120	+	10	—	0
1-4000	+	4400	+	120	—	0	—	0
	Subcultures and counts							
1-2000	+	100	+	0	—	2	—	0
1-2000	+	0	+	0	—	0	—	0
1-4000	+	4300	+	0	—	0	—	0
1-4000	+	6600	+	200	—	0	—	0
1-6000	+	24000	+	300	+	0	—	0
1-6000	+	10000	+	200	—	0	—	0

Control No. 1—280,000 bacteria per rod.
Control No. 2—300,000 bacteria per rod.

The killing dilution of the cationics as based on the Food and Drug Administration phenol coefficient (3) using *Eberthella typhosa* as test organism, is approximately 1-20,000. These dilutions are listed as approximate figures because the killing dilutions vary somewhat in different laboratories and sometimes in the same laboratory at different times. These variations are inherent errors in the F.D.A. phenol coefficient particularly when it is applied to cationic compounds. If we were to accept the *Eberth. typhosa* killing dilution of 1-15,000 as a basis for the use-dilution of the disinfectant and apply the general rule of "5 times the killing dilution," the use-dilution would be 1-3,000.

Mallmann (4) and Mallmann and Leavitt (5) have developed a new method of testing called the "use-dilution" technic. This technic consists briefly of exposing *Straph. aureus* culture on cylinders of glass 1" x ¼", drying for at least 30 minutes on filter paper and exposing in appropriate dilutions of the disinfectant for 1, 5, 10 and 30 minutes at 20° C. The rods are dropped into 10 ml. of standard broth ("Difco" disinfectant). The tubes are shaken thoroughly and 1 and 0.1 ml. portions plated in tryptose agar. The tubes are incubated to detect growth. A typical set of data are presented in Table 1. These data show that a 1-2,000

TABLE 2
The germicidal action of a cationic on *Staph. aureus* using modified filter paper technic

Dilution of Cationic	Original tubes Exposure time in minutes			Subculture tubes Exposure time in minutes					
	5	10	15	5		10		15	
				broth	count	broth	count	broth	count
1-4000	—	—	—	+	480	—	42	+	4
	—	—	—	+	510	—	119	—	78
1-6000	+	—	—	+	Inn	+	450	—	67
	+	+	+	+	Inn	+	480	—	40
1-8000	+	+	+	+	Inn	+	810	+	320
	+	+	+	+	Inn	+	Inn	+	123

kills in 10 minutes but not in 1 or 5 minutes. The plate counts at 5 minutes show a bacterial reduction of 99.9 per cent. If we were to accept these data, the use-dilution would be less than 1-2,000.

Klarmann and Wright (6) demonstrated by means of a wet filter paper technic that the killing dilution of similar cationics on *Eberth. typhosa* would be 2-2,000. With the glass strip technic, which they also present, *Staph. aureus* was not killed completely in a 1-5,000 dilution. Their results in the latter case do show, however, that the percentage-reduction was 99.99+. They do not present any data for *Staph. aureus* using the wet filter paper technic.

In our studies with the wet paper technic using *Straph. aureus*, our results were comparable to those obtained by the use-dilution technic. The data are presented in Table 2. A 1-4,000 dilution failed to produce total kill in 15 minutes although the bacterial reductions were approximately 99 per cent.

If we are to accept the findings of Klarmann and Wright (6) and those from our laboratories based on the wet filter paper technic and the use-dilution technic, the use-dilution of the cationics to be effective would be under 1-1,000.

It is not the purpose of this paper to enter into any discussion of technics and basic principles envolved in the action of cationics, but it is necessary to consider the findings of Klarmann and Wright (6). These workers found that when test organisms are added to a cationic disinfectant-solution that the organisms become attached to the glass surfaces and that sampling of the liquid gives fictitious killing dilutions because of the absence of the organisms in the liquid. They show that complete kill is not obtained by sampling the glass surfaces for the presence of viable bacteria. To determine the possible kill of bacteria suspended in the liquid, and also to obtain data on the rate of kill of bacteria, a technic designated as the speed-reaction test was devised. This technic is part of another paper which we have not published as yet (7). Briefly stated, 1 ml. of *Staph. aureus, Escherichia coli,* and *Micrococcus caseolyticus* agar slant saline washings were added to 10 ml. of various concentrations of the cationic disinfectant. Samplings were made at 5, 10 and 15 second intervals by removing 1 ml. portions and placing in 9 ml. of cold sterile saline containing soap to neutralize the sanitizing agent. Other neutralizing agents were also used to be sure that no bacteriostatic effects were obtained. Appropriate dilutions were made in tryptose glucose extract agar plates to determine the number of surviving bacteria. The results for 70° F. (21° C.) are presented in Table 3.

TABLE 3
The action of alkyl dimethyl benzyl ammonium chloride 70° F. (58° C.)

Test Org.	Dilution	Number of surviving bacteria per ml. 5 sec.	10 sec.	15 sec.
Staph. aureus	1-10,000	0	0	0
	1-15,000	0	0	0
	1-20,000	20,000	0	0
	Control	24,000,000	27,000,000	24,000,000
Esch. coli.	1-10,000	0	0	0
	1-15,000	360,000	120,000	20,000
	1-20,000	60,000,000	36,000,000	2,000,000
	Control	98,000,000	91,000,000	93,000,000
M. caseolyticus	1-10,000	0	0	0
	1-15,000	0	0	0
	1-20,000	30,000	0	0
	Control	640,000	460,000	200,000

An examination of these data shows that even where the time interval is extremely short, and insufficient time is allowed for the migration of organisms to the walls of the tube, kill was obtained. The data are not comparable to the phenol co-efficient, use-dilution, and filter paper technics in that little or no organic matter is added with the test organisms to the medication tubes. However, it is interesting to note the marked difference in results obtained as far as killing dilution and time of reaction is concerned. Dilutions of 1-20,000 gave complete kill of Gram positive bacteria (*Staph. aureus* and *M. caseolyticus*) in 10 seconds. A 1-10,000 dilution gave complete kill of both Gram positive and negative bacteria in 5 seconds.

It is apparent from the data obtained by phenol coefficients, use-dilution, wet filter paper, and speed reaction technics that many conflicting results are obtained. By selecting the proper laboratory technic we can show that the cationics tested are either poor or unusually good disinfectants. It is likely that they are all correct in a sense, when interpreted practically, provided the application is comparable to conditions found in the laboratory technic. Certainly no one of these tests could be applied as a measurement of all field applications. It is difficult to argue the correctness of each laboratory technic unless we resort to field testing. If, in field testing, the cationic works successfully, then it is quite evident that the laboratory technic used for routine laboratory evaluations should be that which most nearly approximates the field findings.

TABLE 4
Sanitization of beverage glasses. Numbers of bacteria on rims of glasses just prior to sanitizing when washed in detergent with stationary brushes and rinsed in running water.

Glass No.	Bacteria Count	Glass No.	Bacteria Count
10	1400	360	3800
20	500	370	2800
30	1200	380	1800
40	1100	390	1700
50	1700	400	1700
60	1800	410	2500
70	1700	420	100
80	3600	430	1000
90	1400	440	400
100	10000	450	1500
110	1600	460	1500
120	1500	470	2100
130	1400	480	500
140	1100	490	1600
150	4800	500	600
160	2300	510	40
170	4400	520	2600
180	3500	530	3400
190	1000	540	1100
200	1200	550	2300
210	1200	560	2600
220	2300	570	1800
230	1600	580	1800
240	4600	590	1000
250	2900	600	4900
260	5800	610	6100
270	1400	620	1800
280	1900	630	2800
290	7000	640	1400
300	1500	650	1900
310	5600	660	4000
320	3100	670	6200
330	900	680	1700
340	1000	690	2200
350	2400	700	2900

IN this particular paper we were concerned with the application of sanitizers in the cold sanitization of beverage glasses. For the first series of tests we selected a beverage place serving wines, beer, and soft drinks. The equipment consisted of three tanks, each of 5 gal. capacity. The first tank contained a detergent and stationary brushes for soil removal, the second tank contained running water to remove the wash water, and the third tank contained the sanitizing agent. In each series of tests every tenth glass, as soon as it had passed through the three tanks, was handed to the sanitarian who immediately swabbed the glass using the standard technic (7).

In the first series the glasses were checked just before entering the sanitizer to determine the bacterial load on the glass. The results for 700 glasses are presented in Table 4. It will be observed that the bacterial populations ranged from approximately 1200 at the start to 2000 at the end of the run. Marked variations in counts occurred ranging on individual glasses from 40 to 10,000. These data give a good picture of the anticipated bacterial load which must necessarily be destroyed by the sanitizer.

In the second series, the glasses were sanitized with sodium hypochlorite (170 p.p.m. available chlorine). The glasses were rinsed rapidly in the chlorine solution and immediately passed to the sanitarian for swabbing. The time elapsing from the time of rinsing to swabbing was approximately 30 seconds. The data are presented in Table 5. The glasses were practically bacteria-free. A few glasses show counts of 10 or 20 which may represent laboratory contamination which is unavoidable. The chlorine residual fell from 170 p.p.m. at the start to 65 p.p.m. at the close of the tests. These data show that under the conditions of handling, sodium hypochlorite gave excellent results. These data are in keeping with previous studies on hypochlorite which have been reported.

In the third series, the glasses were sanitized with chloramine T type sanitizer in a concentration of 180 p.p.m. available chlorine. The tests were conducted in the same manner as before. The results are presented in Table 6.

As observed by an examination of Table 6, the results were unsatisfactory. The bacterial counts ranged from approximately 200 per unit at the start to 1000 at the end of the tests. The chlorine residual fell from 180 p.p.m. to 80 p.p.m. This was expected as the senior author and Devereux (1 and 8) had found this compound in previous studies in food utensil and dairy sanitization to be slow acting. This compound will give satisfactory results if the utensils are kept in contact with the compound for at least 3 minutes.

In the fourth series the glasses were sanitized with a cationic sanitizer in a concentration of 1-6,400. The tests were conducted in the same manner as before. The results are presented in Table 7. The results were excellent and comparable to those obtained with sodium hypochlorite. Although the writer questions the reliability of chemical methods of measuring cationics, particularly in concentrations in excess of 1-7000, it is interesting to note that the residuals were the same at the end of the run as they were at the beginning. The results indicate that the solution was doing an effective job at the end of the run which would tend to at least justify the field kit test for residual measurements. Furthermore we know from another series of studies which have not been published that a 10 second rinse in a dilution of 1-10,000 is effective, so even though the final residual was as low as 1-10,000 we would expect to obtain good results.

In all of these field tests a three tank system was used. The second tank containing running water tended to remove the detergent and soiled wash water before entering the sanitizing solution. In this manner, the sanitizing solution would be active longer by

(*Turn to Page* 161)

TABLE 5
Sanitization of beverage glasses. Number of bacteria on rims of glasses immediately after dipping into sodium hypochlorite (170 p.p.m. — 5 gal. water). (Glasses washed and rinsed as in Table 4)

Glass No.	Bacteria Count	Glass No.	Bacteria Count
10	0	360	0
20	0	370	0
30	0	380	0
40	0	390	10
50	0	400	110
60	0	410	20
70	0	420	0
80	0	430	0
90	0	440	0
100	0	450	0
110	0	460	0
120	0	470	10
130	10	480	0
140	10	490	10
150	0	500	30
160	0	510	0
170	0	520	10
180	0	530	0
190	0	540	10
200	10	550	0
210	10	560	0
220	10	570	0
230	10	580	10
240	0	590	0
250	0	600	0
260	0	610	0
270	0	620	0
280	0	630	0
290	0	640	0
300	0	650	0
310	10	660	0
320	10	670	0
330	10	680	0
340	0	690	0
350	0	700	0

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LIVESTOCK SPRAYS

By Ray L. Cuff*
National Livestock
Loss Prevention Board

WITH one-third of the people of all nations hungry for bread and with most of us hungry for more good beef, the livestock grower today is confronted with the problem of producing more beef with less feed, less manpower and more parasites. By developing new, effective insecticides for controlling lice, flies, grubs and ticks, insecticide manufacturers are giving the livestock industry a chance to produce greatly increased beef supplies. The 1945 DDT tests on cattle, in Kansas, showed that controlling flies is one of the quickest, cheapest and most efficient methods of increasing beef and milk production with no extra cattle, no extra feed and with very little extra labor.

In Kansas, during the summer of 1945, official cooperative tests with DDT for the control of the hornfly were conducted, under practical field conditions, on some 8,000 cattle on 32 farms and ranches in 16 counties, under the joint supervision of the U. S. Bureau of Entomology and Plant Quarantine, the Extension Division of Kansas State College of Agriculture, Office of the Livestock Sanitary Commissioner of Kansas and the Southwestern Regional Office of the National Live Stock Loss Prevention Board of Kansas City, Missouri. The purpose of these tests was:

1. To determine the length of time DDT would continue to protect cattle from the hornfly under farm conditions;

2. To determine the value of DDT to the livestock grower in added production, and

3. To familiarize livestock growers with the proper use of DDT for controlling flies and other external parasites.

We interviewed cattle owners throughout Kansas and finally selected 32 farms and ranches for tests, in 16 counties, scattered throughout the state, in the bluegrass, the bluestem, the mixed bluestem and buffalo grass and the short grass country. More than 8,000 cattle were included in this test. In order to evaluate the efficiency of the DDT treatment, part of the cattle on each farm or ranch were treated. Part were untreated, being pastured as check lots one-half mile or more from the treated lots. Wherever weighing facilities were available, animals were weighed in-and-out of pastures. In some instances we treated only half of a lot to determine whether or not treating part of a lot would control flies on all cattle in the lot.

* Before Natl. Assn. Insecticide & Disinfectant Mfrs., French Lick, Ind., June 17, 1946.

In 14 counties, the cattle were treated by spraying backs, sides, necks and heads with a 0.2 per cent DDT suspension or emulsion. In one county, cattle were dipped in a 0.1 per cent DDT emulsion; in a second county cattle were dipped in a 0.1 per cent suspension of 50 per cent DDT wettable powder.

In each of the 16 counties, the county agent made a fly count on the treated and check lots, every third day, for the first 21 days after treatments. This entailed considerable work, but was a most practical method of developing a number of trained men now interested in fly, louse and grub control. In most instances, we located the hornfly control tests and demonstrations in those counties in which grub control programs had been carried on the past three years, where high-pressure power sprayers were located and where the county agents were interested and experienced in spraying and parasite control. The county agents also cooperated in helping treat the cattle when fly counts indicated treatment was needed. From time to time, during the fly season, we visited the ranches and inspected DDT-treated and check lots of cattle.

On ranches where large numbers of cattle are handled, cattle are dipped or sprayed with power sprayers. However, any hand-sprayer that will penetrate the hair coat and deposit the DDT spray on the hide on both the back and underline will get the job done. A good knapsack sprayer can be used in treating cattle and for spraying barns and sheds to control hornflies, stable flies, house flies and mosquitoes.

In our official tests in Kansas and Missouri, in 1946, we are comparing the effectiveness of DDT in 0.25 per cent, 0.50 per cent, 0.75 per cent, 1.0 per cent, 2.50 per cent and 5.0 per cent suspensions in sprays of from one to two quarts, applied to the backs of cattle. On one ranch we are running a comparison of dipping cattle with a DDT emulsion and spraying with a DDT suspension. In two Kansas tests we are comparing the effectiveness of like concentrations of DDT and BHC. On three Missouri State-owned farms we are studying the effect of fly control in milk production by spraying with a 0.5 per cent DDT suspension, another with 1.00 per cent DDT suspension, with the third herd as a check.

The duration of effectiveness of spray containing 0.2 per cent DDT in suspension, applied to Kansas beef cattle in 1945 was:

1. First spray, 13.9 days, or 2 weeks.

2. Second spray, 20.6 days, or 3 weeks.

3. Third spray, 29.5 days, or 4 weeks.

Fourth spray, 32.2 days, or remainder of fly season.

DURING June, July, August and September, in Kansas and surrounding states where cattle are grown and fed commercially, cattle are pestered with biting, blood-sucking hornflies and stable flies, in particular. In some localities, along streams and in wooded areas, the horse fly (Tabanid) attacks livestock to the point of leaving the animal with blood oozing from the bitten areas. In some areas, mosquitoes take over the night shift in making life miserable for livestock. In the cattle producing and feeding areas, flies have always been the direct cause of smaller gains and resulting lower profits. In fact, flies had practically stopped the summer dry-lot feeding of cattle. The 1945 Kansas DDT hornfly control tests demonstrated the use of a new, inexpensive material that actually kept cattle free from hornflies without apparent injury to treated animals. Where cattle were yarded in or near barns or sheds we found it necessary to spray buildings as well as cattle. A single application of 2.5 per cent DDT to 5.0 per cent DDT as a residual surface spray on barns and sheds controlled flies effectively for three months. However, we found it a practical procedure to spray the barns and sheds with whatever material we happened to have left in the spray-tank, after spraying the cattle. Spraying barns and sheds with a 0.2 DDT per cent concentration every time the cattle are treated three or four times during the fly season results in faster operation, because the operator has to make up only one mix. Flies apparently are controlled by this method.

In the 1945 official tests in Kansas and in the 1946 official tests in Kansas and Missouri, DDT materials were furnished free of charge to livestock growers by the U. S. Bureau of Entomology, some of our larger cooperating chemical manufacturing companies, the Sears Roebuck Foundation and our office. Each Kansas county now has high-pressure, power spray equipment. Our office is furnishing the spray equipment for all tests in Missouri. The cost of DDT treatment of cattle is relatively inexpensive. Four pounds of 50 per cent DDT wettable powder at approximately 60 cents per pound added to 100 gallons of water gives a 0.24 per cent DDT suspension that will spray from 100 to 200 head of cattle, at from 1.2 cent to 2.4 cents per head, per application, or a total of from five to ten cents for four applications for fly protection during the entire fly season.

Cattle

	Treated Pasture Weight Pounds				*Untreated Pasture Weight Pounds*				*Average Gain Per Animal Treated Over Untreated*	
Owner	*No.*	*In*	*Out*	*Gain*	*No.*	*In*	*Out*	*Gain*	*Lbs.*	*Daily, for 90 Days*
Barber County ...	55	1,080	1,305	225	16	972	1,146	174	51	.56
Kiowa County ...	175	570	794	224	50	567	761	194	30 (60 days)	.50
Saline County ...	42	1,110	1,215.5	105	42	1,022	1,085.5	63	42.2	.47
Smith County	45	895.5	998	102.5	41	867	928	61	43.7	.49
Calves										
Barber County ...	45	150	470	320	14	125	386	261	59	.66
Saline County ...	28	183	347.3	164.3	36	236.1	353.5	117	46.9	.52
Smith County	27	160	429	269	28	211	407	196	73	.81

Special spraying rack to ensure adequate spray coverage of the "underline." The spray must penetrate the hair coat and leave a deposit of DDT on the hide for maximum effectiveness. In the Kansas tests cattle sprayed with DDT made an additional average gain in weight of a half pound per day in excess of the weight gained by unsprayed cattle.

In the fly season, it is a common sight to see cattle bunched on a hill, fighting flies, for about six hours in the middle part of each day. Cattle growers were amazed to see that our DDT treated cattle "fanned out" on the pasture during the entire day. As these treated cattle grazed approximately one-third longer per day than the untreated animals, their intake was greater. More food consumed together with comfort made them put on more weight. Milk production of dairy cows increased from 8 per cent to 20 per cent. When the DDT treated beef cattle came to market, cattle buyers bid from 25 cents to 50 cents per cwt. more on these cattle because of their "bloom."

In the 1945 Kansas tests, the DDT treated cows and steers made an additional, average gain of approximately one-half pound per day and calves two-thirds pound per day, during the 90 day period when hornflies were most numerous. The accompanying table shows gains in weight of cattle and calves treated with DDT for the control of the hornfly (Siphona Irritans.) as compared with gains of untreated cattle and calves, Kansas tests, 1945:

Our Observations

A SUMMARY of our observations on DDT fly control tests is:

1. DDT treatment of cattle will revolutionize summer cattle feeding.
2. It will increase gains on pasture cattle and calves during three months' fly season from one-half pound to one pound per day. Gains make profits.
3. Because DDT treated cattle show better quality, they sell for more.
4. It increases milk supply from 5 per cent to 20 per cent.
5. Spraying barns, sheds, chicken and hog houses clears building from flies fleas, mosquitoes, grain bettles, etc. for comparatively long periods.
6. Treating calves and barns helps prevent calf scours.
7. DDT treatment helps clear up raw spots on skin made by flies.
8. Treating cattle means added protection from disease organisms, such as Anaplasmosis, Pink Eye, etc.
9. DDT is effective as a practical louse-killer on most farm animals. DDT, in proper formulations and concentrations, is safe for both humans and cattle, and has long residual properties, is efficient and inexpensive.

Flies Are Disease Spreaders

MANY cattlemen in the Southwest believe that controlling flies on cattle will do much toward checking the spread of certain disease which can be transmitted by insects, i.e. Anaplasmosis. One cattleman whose herd we treated, seems very certain that the DDT treatment was a factor in controlling Pink Eye in his cattle. The DDT treated cattle were free from Pink Eye, while those untreated cattle in check lots on his ranch as well as cattle in his neighbors' pastures were badly infected. Another farmer whose cattle were included in the tests stated that spraying his calves and calf pens with DDT prevented the spread of bacterial scours in his calves.

Cattlemen are sold on the idea of spending only five cents per head

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Quaternary Ammonium Germicides

Comparative Methodological Studies Show The original F. D. A. Method of Disinfectant Testing to Be Unsuitable For Quaternary Ammonium Compounds

By E. G. Klarmann and E. S. Wright*
Lehn & Fink Products Corp.

IT was shown in our preceding paper (1) that the application of the original F. D. A. testing method to disinfectants of the quaternary ammonium class will yield an erroneous idea as to their germicidal potency. Certain modifications of this technic, however, bring out the fact that these compounds produce a bactericidal action in concentrations substantially higher than observed when using the original F.D.A. method; in turn, this means that, as disinfectants, the quaternary ammonium compounds appear to be considerably weaker than has been claimed right along. For these reasons, we postulated that the original F.D.A. procedure should not be employed in their evaluation as general disinfectants.

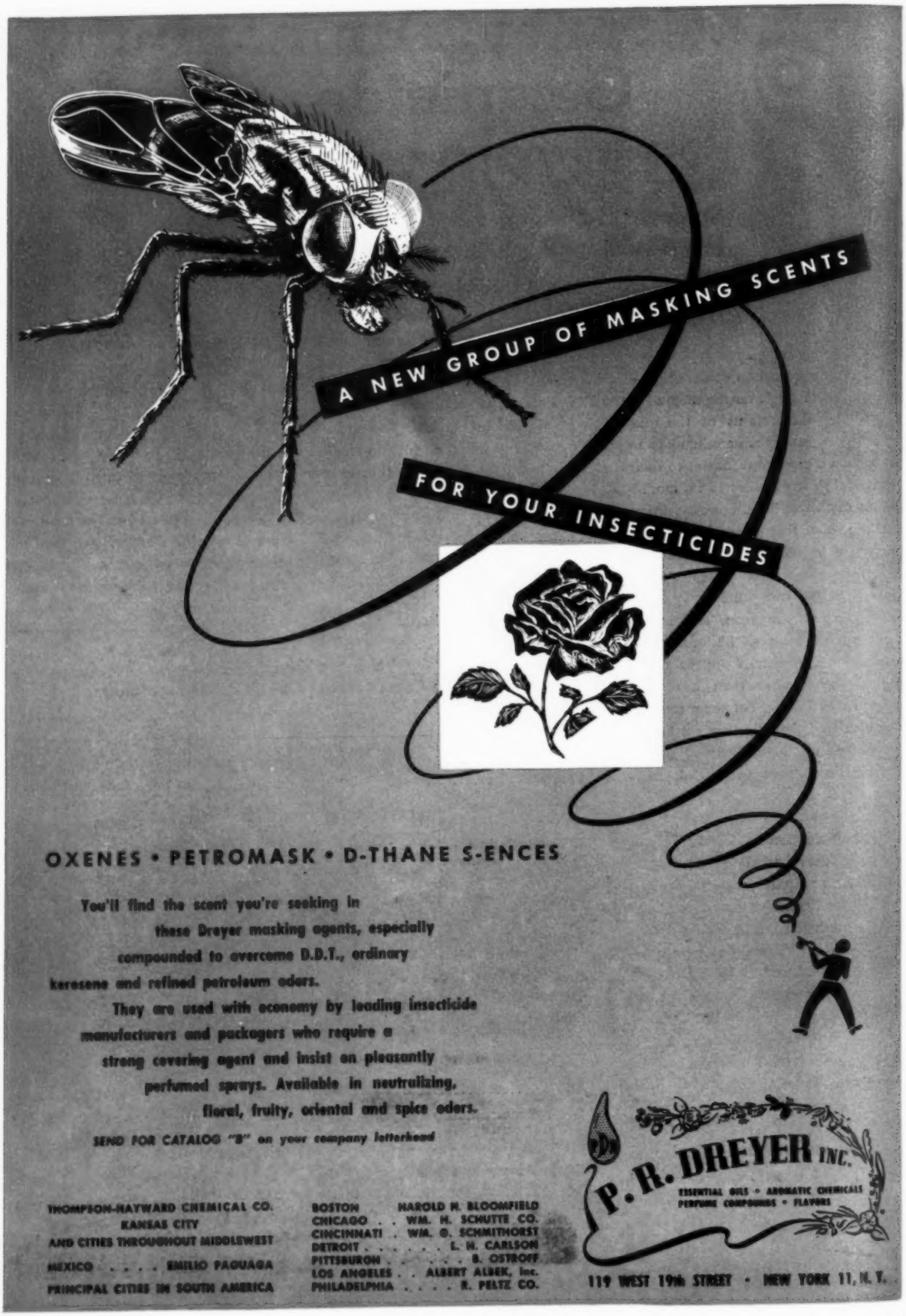
The latter statement is based upon the acceptance of the validity of the basic ideas underlying the F.D.A. procedure, and particularly of employing in the determination of disinfectant strength the minimum concentrations in which a complete germicidal effect is produced. If instead of calling for complete germicidal action in such concentrations, some other method were to require merely a reduction of the bacterial count to a specified degree, the class of the quaternary ammonium compounds might appear in a different light. This is why it was pointed out previously that, at this time at any rate, our findings are not intended for direct consideration in connection with, e.g., the sanitation of dishes.

If a substantial reduction of the bacterial count is made the criterion of fitness for this particular use, the class of quaternary ammonium compounds may be expected to satisfy this criterion; here the situation would be somewhat analogous to that existing in the case of purification of drinking water, where a reduction of the bacterial count to a specified limit (or below it) is aimed at, rather than complete sterilization. However, the F.D.A. method of testing and evaluating disinfectants does not concern itself with a decrease of the bacterial count. If a particular dilution of the disinfectant under test is not completely germicidal, it does not matter whether otherwise it might be capable of reducing the bacterial count by 75 or 90 or even 99 per cent, the presumption being that the portion of the culture which resisted the action of this disinfectant concentration would

TABLE I
Filter Paper Technic —20°C
Minimum Concentrations Germicidal in 10 Minutes

	Eb. typhosa		*Es. coli*		*Sh. paradysenteriae (Flexner)*	
Disinfectant	*F.D.A. Technic*	*Filter Paper Technic*	*F.D.A. Technic*	*Filter Paper Technic*	*F.D.A. Technic*	*Filter Paper Technic*
Phenol	1:80	1:70	1:70	1:70	1:70	1:70
Cresol Compound U. S. P.	1:160	1:120	1:120	1:100	1:100	1:80
Cresylic Disinfectant (declared p. c. 5)	1:500	1:350	1:400	1:300	1:300	1:250
Synthetic Phenolic Disinfectant I	1:150	1:150	1:100	1:100	1:100	1:100
Synthetic Phenolic Disinfectant II	1:600	1:400	1:400	1:400	1:300	1:250
Coal Tar Dis. (declared p.c. 7.5)	1:700	1:300	1:400	1:100	1:300	1:100
Dodecylamine 10%	1:1500	1:200	1:1000	1:100	1:1000	1:150
Quat. Ammonium Compound A 10%	1:1500	1:200	1:1000	1:200	1:800	1:100
Quat. Ammonium Compound B 10 %	1:800	1:10	1:600	1:5	1:600	1:10
Quat. Ammonium Compound C 10%	1:1500	1:25	1:2000	1:40	1:1500	1:30
Quat. Ammonium Compound D 0.1%	1:15	permits growth	1:15	permits growth	1:15	permits growth

* Before Natl. Assn. Insecticide & Disinfectant Mfrs., French Lick., Ind., June 18, 1946.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be capable of continuing as a potential source of infection.

To reduce this risk still further the recommended use concentration of a given disinfectant is not identical with the minimum germicidal concentration found under the experimental conditions of the F.D.A. test; instead, by regulatory practice, it is made to correspond in regard to its germicidal potency to a 5 per cent solution of pure phenol. But even with this added safeguard the quaternary ammonium compounds do not appear to possess the required capacity of acting as "complete" germicides.

Experiments With the Typhoid-Colon Group

IN continuing the work described in our preceding publication, we were interested in extending the inquiry which began with *Eb. typhosa* first to other pathogenic Gram-negative bacteria, using the "filter paper" technic described previously. We modified this technic slightly by dropping the 5 and 15 minute exposure intervals (for the sake of time economy) and retaining only the 10 minute interval. We also adopted Whatman's No. 2 filter paper (instead of No. 14 which is difficult to procure), without noting any influence upon the results of the tests. The following Table I gives the findings obtained with *Es. coli* and *Shigella paradysenteriae* (Flexner) in comparison with the previously reported results for *Eb. typhosa*.*

Again it is found that there is a very marked reduction of the apparent germicidal potency of the four quaternary ammonium compounds and of the long chain alkylamine when the "filter paper" modification is substituted for the original F.D.A. method. Nothing nearly as pronounced is observed with phenol or with the other disinfectants tested although the coal tar (emulsifiable) disinfectant exhibits a comparatively greater loss of germicidal power.

Continuation of Experiments With S. aureus

WHILE working with our first or "semi-micro" modification of the F.D.A. method previously described (involving the use of one-tenth the volumes of disinfectant dilutions and broth culture specified by the original procedure) we noted the great inhibitory action upon *S. aureus* of the compounds of the quaternary ammonium class. Although our medication mixtures were diluted with as much as 200 cc. of broth, bacteriostasis was not eliminated while evidence was obtained of a marked reduction of the apparent germicidal efficiency with respect to *S. aureus* as a result of employment of this modification of the F.D.A. method.

More recently we applied the "filter paper" technic in the tests with *S. aureus*. The rather extraordinary bacteriostatic action upon this test-organism of the quaternary ammonium compounds is evident from the fact that the infected filter paper can be retransferred to as many as ten tubes of broth (each containing 20 cc. of it), at 10 minute intervals, without elimination of bacteriostasis. A representative test is illustrated by Table II which gives the results obtained with the quaternary ammonium compound C (10%).

TABLE II

Filter Paper Technic—S. aureus —20° C.
Quaternary Ammonium Compound C —10%

Dilutions	*F.D.A. Broth*										*Serum Broth*		
1:100	*	*	*	-	-	-	-	-	-	*	*	-	**
1:200	*	*	**	-	-	-	-	-	-	*	-	-	-
1:300	*	**	-	-	-	-	-	-	-	*	-	+	+
1:400	*	-	+	+	+	+	+	*			+	+	+
1:500	*	+	+	+	+	*					+	+	+
Phenol													
1:50	-	-									-	-	
1:60	-	+									-	+	
1:70	+	+									+	+	
1:80	+	+									+	+	

* Complete inhibition.
** Partial inhibition.

When one-half cc. of a 24 hour culture of *S. aureus* is placed in a tube containing a piece of filter paper (of specified size) and exposed to the action of 5 cc. of, e.g., a 1:100 dilution of this disinfectant, the following is found: the filter paper may first be transferred three times to 20 cc. of F.D.A. broth (being left every time for 10 minutes in contact with the broth) and it carries enough disinfectant to produce a bacteriostatic concentration in the first three tubes, as shown by the fact that inoculation with one loop of *S. aureus* culture of all tubes following a 48 hour incubation fails to produce growth in these three tubes; moreover, after passing through six additional tubes, enough disinfectant is still present on the filter paper to induce bacteriostasis in the tenth tube in which the paper is allowed to remain during incubation. Similar phenomena were observed with the 1:200 and 1:300 dilutions; while less disinfectant was carried by the paper following exposure to these lower concentrations, as evidenced by bacteriostasis occurring in the first three or the first two tubes respectively, there is complete bacteriostasis again in the tenth tubes in both instances where inoculation with *S. aureus* took place with the filter paper remaining in these tubes.

In the case of the 1:400 and 1:500 dilutions bacteriostasis is eliminated in the second tubes, yet the last tubes in each instance acquire bacteriostatic concentrations of the quaternary compound when the filter pa-

* The strain of *Es coli* used in this investigation is No. 26 from the American Type Culture Collection, that of *Shigella paradysenteriae* (Flexner) is No. 9380 from the same source. Both were cultured and used in the same manner as *Eb. typhosa*.

Following are the formulas of the two synthetic phenolic disinfectants used in this work:

Synthetic phenolic disinfectant I

	Per Cent
p-Chlorophenol	15.00
Potassium ricinoleate	34.00
Alcohol	15.00
Glycerol	3.00
Water	33.00

Synthetic phenolic disinfectant II

	Per Cent
o-Phenylphenol	15.00
Potassium Ricinoleate	34.00
Alcohol	15.00
Glycerol	3.00
Water	33.00

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TABLE III
Filter Paper Technic—S. aureus 20°C.
Minimum Concentrations Germicidal in 10 Minutes

Disinfectant	*F.D.A. Technic*	*Filter Paper Technic*	*Number of Transfers*
Phenol	1:60	1:50	2
Cresol Compound U.S.P.	1:90	1:50	2
Cresylic Disinfectant	1:200	1:100	2
Synthetic Phenolic Disinfectant I	1:40	1:30	2
Synthetic Phenolic Disinfectant II	1:250	1:125	2
Coal Tar Disinfectant	1:100	1:50	2
Dodecylamine 10 per cent	1:400	1:100	2
Quat. Ammonium Compound A 10 per cent	1:1500	1:400	10
Quat. Ammonium Compound B 10 per cent	1:1500	1:100	10
Quat. Ammonium Compound C 10 per cent	1:2500	1:300	10
Quat. Ammonium Compound D 0.1 per cent	1:30	0.1% solution permitted growth	10

per is allowed to remain in these tubes. By contrast, in the case of phenol a clear-cut picture is furnished by the second transfer tube.

In order to avoid the need of making so many transfers in the case of the quaternary ammonium compound we inquired into the possibility of other means of eliminating bacteriostatic action. We found that addition of serum to our transfer tubes (2 cc. to each 20 cc. of F.D.A. broth) yielded a simple method of achieving this end. This is shown by the results headed "Serum Broth" in Table II; evidently the presence of serum interferes with the bacteriostatic action of the quaternary ammonium compounds since only three transfers are required for clear-cut readings. No change is observed in the case of phenol where only two transfers are sufficient regardless of whether or not serum is used in the transfer broth. (Of course, no serum was used in any of the "medication" tubes in which the bacterial culture was exposed to the various disinfectant dilutions.)

In Table III, the effect upon *S. aureus* (at 20° C.) of several disinfectants is considered as determined by the F.D.A. and the "filter paper" technics respectively (without the use of serum); the number of transfers employed is given in the third column which indicates that two transfers only were sufficient in all cases of phenolic materials, whereas ten transfers were employed with the quaternary ammonium compounds. While phenol itself and the synthetic phenolic disinfectant I do not show any appreciable variation in the results obtained by the two methods, the other phenolic disinfectants appear to suffer an impairment of their germicidal power to the extent of 50 per cent under the conditions of the "filter paper" test. However, a very much greater loss of germicidal power is experienced by the quaternary ammonium compounds and by dodecylamine; the commercially available 0.1 per cent solution of the quaternary ammonium compound D appears to be lacking in "complete" germicidal power in this case, as it did in the case of the Gram-negative bacteria referred to before.

Having ascertained that the presence of serum interferes with the bacteriostatic action of low concentrations of the quaternary ammonium compounds, we were next interested to learn to what extent this experience may be utilized in our first or "semi-micro"-modification of the F.D.A. method (which calls for the use of one-tenth the volumes of disinfectant dilutions and bacterial inoculum required by the original F.D.A. procedure), when applied to tests with *S. aureus*. The results thus obtained may be compared with those observed by the "filter paper" technic in Table IV.

This table shows that in the case of phenol both modifications yield the same results which, incidentally, differ but slightly from the results of the regular F.D.A. test. In the case of the Cresol Compound U.S.P. and of the synthetic phenolic disinfectant II the "filter paper" technic with serum-broth transfers reduces the apparent germicidal power by about one-half and two-thirds respectively as compared with the results of the regular F.D.A. method. However, only one-fifth of the original germicidal effect remains in the case of the quaternary ammonium compound A by either modification; and the quaternary ammonium compound D (0.1 per cent) which would permit dilution to the extent of 1:30 by the original F.D.A. method is found to be germicidal only in a 50 per cent concentration by the "semi-micro"-modification of the F.D.A. method, and non-germicidal by the "filter paper" technic.

Incidentally, when operating with the "semi-micro"-modification of of the F.D.A. method, whole serum was used to dilute the medication mixture in an effort to suppress bacterio-

TABLE IV
Results of Comparative Testing Procedures S. aureus —20° C.

	F.D.A. Technic Minimum Concentration Germicidal in 10 min.	*Modified F.D.A. Technic I Minimum Concentration Germicidal in 10 minutes*				*Filter Paper Technic—minimum Concentration Germicidal in 10 minutes*			
		F.D.A. Broth		*Serum Broth*		*F.D.A. Broth*		*Serum Broth*	
Disinfectant			*Vol. of broth*		*Vol. of 50% serum*	*No. of transfers*		*No. of transfers*	
Phenol	1:60	1:50	20 cc.	1:50	40 cc.	1:50	2	1:50	2
Cresol Comp. U. S. P.	1:90	1:80	20 cc.	1:70	40 cc.	1:50	2	1:50	2
Synthetic Phenolic Dis. II	1:250	1:175	20 cc.	1:150	40 cc.	1:150	2	1:100	2
Quat. Ammonium Comp. A 10%	1:1500	1:500[1]	200 cc.	1:300[2]	40 cc. of whole serum	1:400	10	1:300	3
Quat. Ammonium D. 0.1%	1:30	1:5[1]	200 cc.	1:2[2]	40 cc. of whole serum	permits growth	10	permits growth	3

1. Complete inhibition.
2. Partial inhibition.

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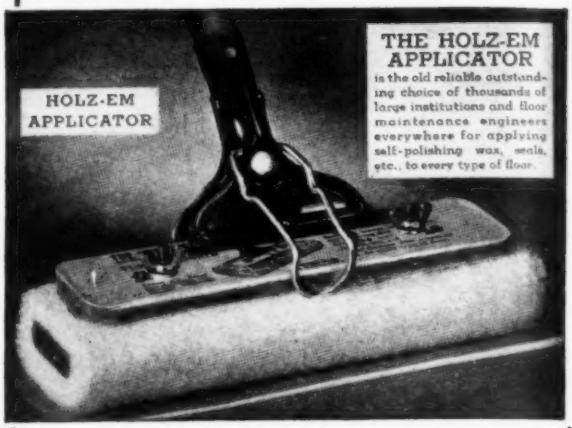
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TABLE V

Results of Comparative Testing Procedures; Eb. typhosa —20°C

Disinfectant	F.D.A. Technic Minimum Concentration Germicidal in 10 min.	Modified F.D.A. Technic I Minimum Concentration Germicidal in 10 minutes				Filter Paper Technic—minimum Concentration Germicidal in 10 minutes			
		F.D.A. Broth Vol. of broth		Serum Broth Vol. of serum		F.D.A. Broth No. of transfers		Serum Broth No. of transfers	
Phenol	1:80	1:70	20 cc.	1:70	2 cc.	1:70	2	1:60	2
Cresol Compound U.S.P.	1:160	1:140	20 cc.	1:120	2 cc.	1:120	2	1:100	2
Synthetic Phenolic Disinfectant II	1:600	1:500	20 cc.	1:500	2 cc.	1:400	2	1:400	2
Quat. Ammonium Compound A 10%	1:1500	1:200	40 cc.	1:200	4 cc.	1:200	2	1:200	2
Quat. Ammonium Compound D 0.1%	1:15	permits growth	100 cc.	permits growth	2 cc.	permits growth	2	permits growth	2

stasis; however, subsequent inoculation with *S. aureus* proved that even this expedient was not successful since partial inhibition was observed in both cases of the quaternary ammonium compounds tested. In view of this it is not surprising that complete inhibition resulted in the absence of serum even though the large volume of 200 cc. of broth was used to dilute the small volume of 0.55 cc. of the medication mixture.

Serum in Modified F.D.A. Tests With Eb. Typhosa

BECAUSE of the findings with serum in tests using *S. aureus*, we were interested to learn what effect the use of serum would have upon the results with *Eb. typhosa* as test-organism. Table V shows that the addition of serum does not affect the readings obtained by the two modifications of the F.D.A. method presumably because the dilution feature inherent in both of them suffices to eliminate bacteriostasis with respect to *Eb. typhosa* (unlike in the case of *S. aureus* which is markedly more susceptible to the bacteriostatic action of the quaternary ammonium compounds).

With this information at hand it was intriguing to ascertain the performance of a quaternary ammonium compound in a dilution actually recommended for general disinfecting purposes. The quaternary compound A (10 per cent) was selected whose label suggests the use of 1 ounce to 4 gallons of water for "general disinfection." This concentration corresponds approximately to 1:500 and is derived from the claimed phenol coefficient of 25 (viz. 20 times 25). By definition it should be equivalent to a 5 per cent solution of phenol in its effect upon *Eb. typhosa*.

Of course, we knew from previous tests, including those illustrated by Table V, that this 1:500 dilution of the quaternary ammonium compound A (10 per cent) would not be germicidal for *Eb. typhosa* even in 10 minutes. (Table V indicates that only a dilution of 1:200 is germicidal in this period of time). However we wished to know what length of time would be required for the 1:500 dilution to produce a germicidal effect. To learn this, we employed the "semi-micro" modification, with serum added to the transfer tubes to suppress bacteriostasis. In two tests, *Eb. typhosa* was found to survive exposures to a 1:500 dilution for 40 minutes. At this moment, it is as yet unknown just what length of exposure will produce disinfection.

This finding should be contrasted with the situation existing in the case of phenol where a 5 per cent solution effects disinfection probably in less than a minute. And yet on the basis of the F.D.A. method's requirements, the 1:500 dilution of the quaternary ammonium compound A (10 per cent) and the 5 per cent solution of phenol are supposed to be equivalent in action insofar as general disinfection is concerned.

Experiments With Streptococcus (hemol.)

BECAUSE of the important position which the streptococcus class of microorganisms holds in epidemiology, we ran a number of comparative experiments using a scarlatinal strain of *Strep. hemolyticus* (N.Y. 5, Lyall H), as test organism.* We used the "filter paper" technic; 2 cc. of serum was added to 20 cc. of broth in the transfer tubes to eliminate bacteriostasis. Our findings are given in Table VI.

The situation encountered here is similar to that found in the case of *S. aureus* (Table III); the phenolic disinfectants tested appear to experience a drop up to 50 per cent by the "filter paper" technic as compared with the regular F.D.A. method while no significant variation in results is displayed by phenol itself. By contrast

* This microorganism was cultured on broth of the following composition:

Beefheart infusion	1,000 cc
Sodium Chloride	5 grams
Neopeptone (Difco)	20 grams
Yeast extract (Difco)	3 grams

TABLE VI

Filter Paper Technic—Strep. Hemolyticus —20° C.
Minimum Concentrations Germicidal in 10 Min.

Disinfectant	F.D.A. Technic (adjusted)	Filter Paper Technic Serum Broth	Number of Transfers
Phenol	1:90	1:80	2
Cresol Compound U.S.P.	1:300	1:150	2
Synthetic Phenolic Disinfectant I	1:200	1:150	2
Synthetic Phenolic Disinfectant II	1:600	1:300	2
Quaternary Ammonium Compound A 10 per cent	1:2500	1:600	3
Quaternary Ammonium Compound D 0.1 per cent	1:40	0	3

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the quaternary compound A (10 per cent) appears to retain only about one-fourth of its germicidal potency while the commercial solution of the quaternary compound D (0.1 per cent) is not capable of effecting disinfection in 10 minutes at room temperature.

Experiments with Dried Smears of S. aureus

THE findings reported in Table IV suggested an experiment with dried *S. aureus* smears approximating the condition of a practical use, e.g., the cold disinfection of a surgical appliance. To this end we proceeded as follows:

Glass strips 10 x 38 mm. were placed in Petri dishes with porous tops and sterilized in the oven at 170° for 2 hours. Using a 1 cc. pipette each strip was smeared with 0.1 cc. of a 24 hour broth culture of *S. aureus*, care being taken to spread the smear evenly along the strip. After replacing the porous covers, the glass strips in the Petri dishes were dried for 24 hours at 37° C. under a current of air. The glass strips were then transferred to sterile 18 x 150 mm. test tubes and placed in a water bath at 20° C. Ten cc. volumes of the various disinfectant dilutions were added. At the end of 10 minute exposure intervals the glass strips were withdrawn and transferred to 20 cc. of broth. After another 10 minutes the glass strips were transferred to second, third and fourth culture tubes when quaternary ammonium compounds were being tested. For other disinfectants where no bacteriostasis was involved two transfers sufficed. (When 20 cc. of broth plus 2 cc. of sterile horse serum was used only three transfers were necessary for the quaternary ammonium compounds. Two transfers were still used for the other disinfectants.)

Table VII gives the results of these tests.

It appears that the resistance to phenol of *S. aureus* is not altered by drying under the conditions stated. The minimum germicidal concentrations of the Cresol Compound U.S.P. and of the synthetic phenolic disinfectant II correspond closely to those obtained with the "filter paper" tech-

TABLE VII
Dried S. aureus —20° C.
Minimum Concentrations Germicidal in 10 Minutes

Disinfectant	*F.D.A. Broth*	*Serum Broth*
Phenol	1:60	1:60
Cresol Compound U.S.P.	1:60	1:50
Synthetic Phenolic Dis. II	1:100	1:70
Quat. Ammonium Compound A 10%	1:200	1:200
Quat. Ammonium Compound B 10%	1:80	1:60
Quat. Ammonium Compound C 10%	1:200	1:100
Quat. Ammonium Compound D 0.1%	1:1	permits growth

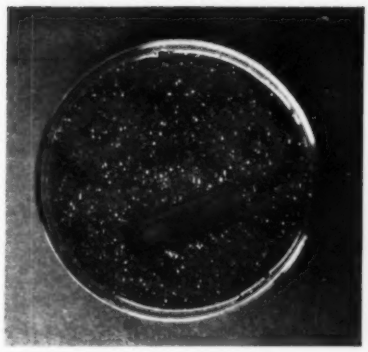


Figure 2

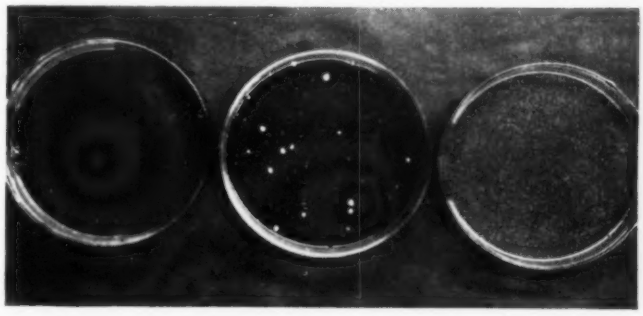
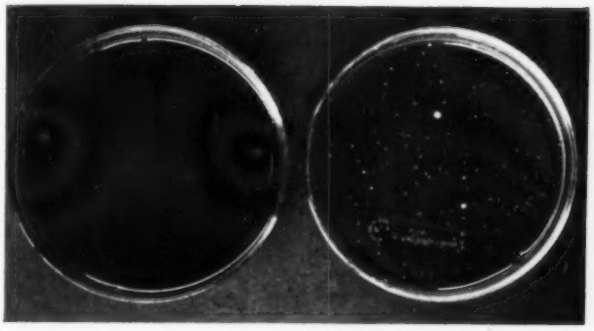


Figure 1



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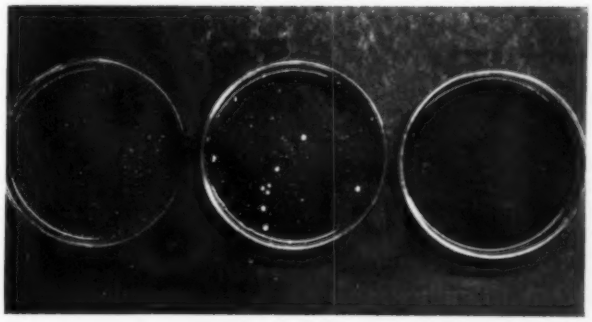
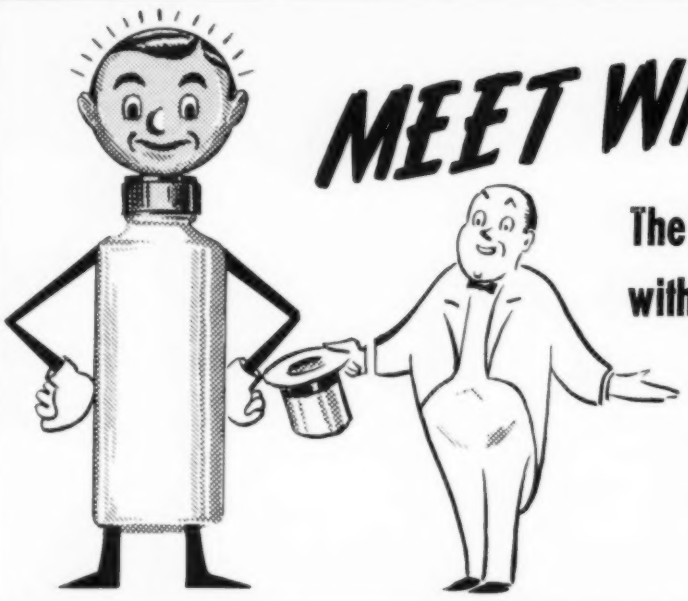


Figure 4



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nic using serum broth for transfers. An even higher concentration of the quaternary ammonium compound A (10 per cent) is needed here to effect disinfection, viz., 1:200 as against 1:300 obtained with the other testing method mentioned, while the quaternary ammonium compound D (commercial solution of 0.1 per cent) is not germicidal here, just as it was not germicidal in the other test referred to above.

An illustration of the decrease of the bacterial count under the influence of the various dilutions of the quaternary disinfectant A (10 per cent) is furnished by Fig. 1, which shows the appearance of three Petri-dishes with serum agar after plating of the glass strips exposed respectively to the 1:200, 1:300 and 1:400 dilutions for 10 minutes at 20° C. Fig. 2 shows the Petri-dish containing the glass strip treated with the quaternary ammonium compound D (0.1 per cent); as pointed out above, no disinfection took place in this case and an appreciable number of cells appears to have survived the treatment. Fig. 3 shows what happened to the glass strips exposed respectively to the 1:60 and 1:80 dilutions of phenol; disinfection in the former case, partial survival of the culture in the latter, are evident.

In connection with Fig. 1 it should be noted, incidentally, that the non-germicidal borderline concentrations (1:200 and 1:300) permit the survival of an appreciable number of microorganisms; here it is not a question of just a very few particularly resistant cells which withstand the action of the antibacterial agent.

Fig. 4 is representative of our attempt to determine the length of time required to effect disinfection. Working with the commercial 0.1 per cent solution of the quaternary ammonium compound D, we exposed the glass strips with dried *S. aureus* smears to its action for different lengths of time. This was followed by plating in serum agar. This figure illustrates the appearance of the plates after 10, 30 and 60 minutes respectively. Disinfection appears to have taken place some time after the 30 but before the 60 minute period of exposure.

TABLE VIII
Dried S. aureus—Steel Strips
—20° C.
Minimum Concentration Germicidal in 10 Minutes

Disinfectant	*Serum Broth*
Phenol	1:70
Synthetic Phenolic Dis. II...	1:70
Quat. Ammonium Compound A 10%.....	1:200
Quat. Ammonium Compound D 0.1%.....	permits growth

These results correspond in all significant regards to those reported in the preceding Table VII.

This would indicate that the germicidal effect of quaternary ammonium compounds takes place more slowly than, e.g., that of phenol, considering the use of a comparatively concentrated solution of the former (such as the 0.1 per cent solution of the quaternary ammonium compound D, as it occurs on the market).

In order to eliminate any question as to carrier material, some tests were performed also on stainless steel strips (10 x 40 mm.) with dried *S. aureus* smears. Using serum broth in the transfer tubes, and employing the same technic as with the glass strips, in all others respects, we obtained the results given in Table VIII.

Discussion

THE results given in the preceding chapters confirm and supplement those reported previously. Again it appears that the original F.D.A. method of testing disinfectants is not suitable for application to quaternary ammonium compounds, and that a much greater germicidal power is being ascribed to these compounds in terms of "phenol coefficients" or otherwise, than is warranted by their capacity of performance under the conditions of a testing method adopted to take care of their peculiarities. It was shown previously that when running the regular F.D.A. procedure with the compounds of the quaternary ammonium class, the transfers made into the subculture tubes from the medication mixtures are not representative of the latter. This factor as well as the factor of marked inhibitory power as shown by these compounds, militate against their evaluation by the F.D.A. method involving a quantitative comparison with phenol (carbolic acid) whose mode of action is so different in all significant regards.

The high phenol coefficient figures claimed for the quaternary ammonium compounds on a manifestly improper basis, also create an unjustified economic disadvantage to other germicides. The phenol coefficient often plays an important role in the purchase of disinfectants; a user of disinfectants cannot be blamed if he attributes, e.g., to a quaternary disinfectant with a claimed phenol coefficient of 25, five times the disinfectant power of a phenolic disinfectant with a phenol coefficient of 5, and if he gives due consideration to this relationship in setting up his disinfectant budget. Of course, he might take a different view of the situation if he knew that the product with the claimed phenol coefficient of 25 is entitled actually to a phenol coefficient of only 2.8, while the phenolic disinfectant with a declared phenol coefficient of 5 may still exhibit approximately the same germicidal efficacy under the modified testing conditions.

The modifications of the F.D.A. method previously described, when applied to tests with important pathogenic bacteria other than *Eb. typhosa,* show that the quaternary ammonium compounds are much weaker as germicides, also with respect to such germs. By way of an example, a commercially available solution of 0.1 per cent of a quaternary ammonium compound was not completely germicidal in ten minutes for staphylococci or streptococci; it did not effect disinfection of a dried smear of *S. aureus* which is readily disinfected by the action of a 1:60 dilution of phenol, although on the basis of the original F.D.A. method, and on that of the germicidal potency claimed for it, it should have been able to accomplish this even when diluted with water to the extent of some 25 or 30 times the original concentration. In view of this and similar facts the question must be raised again as to the justification of employing a procedure of evaluation which is based upon the

(*Turn to Page* 163)

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INSECTICIDAL AEROSOLS

Stability in storage studied by accelerated aging tests

By
A. C. Hazen and Lyle D. Goodhue*
Bureau of Entomology and Plant Quarantine, U.S.D.A.

IN a previous paper (Goodhue, *4*) it has been shown that stability in storage is an important consideration in evaluating new aerosol formulations. Failure in storage may include corrosion of the metal container, or "bomb" (Goodhue, *2*); decomposition of ingredients; interaction of solvents; formation of color, tars, or precipitates; or any other change which might cause clogging of the nozzle, weaken the container (a condition especially important to avoid if the container is refillable), produce objectionable odor, or in some other way reduce the efficiency of the aerosol (Goodhue and Sullivan, *6*).

As long as the formula containing only pyrethrum and sesame oil in dichlorodifluoromethane (Freon-12) was in use, this problem was of minor proportions, but with the addition of DDT to the formula it has become important. DDT tends to liberate hydrochloric acid in the presence of some metals and their salts (Fleck and Haller, *1*). Tests in this laboratory have shown that some substances may catalyze the formation of hydrochloric acid, while others may inhibit it; hence, in certain formulas containing DDT decomposition takes place more rapidly than in others.

In order to expedite a study of the changes which take place in an aerosol, an accelerated-aging test was developed and applied to several aerosol formulas (Goodhue and Ballinger, *5*). This paper describes further tests in which the effect of adding various stabilizers, or inhibitors, to prevent the failure in storage was studied.

Table 1.—Percentage composition of basic aerosol formulas that were tested.

	Formula												
Constituent	65	179	199	305	334	335	337	338	343	350	351	353	354
Pyrethrum extract (20%)	—	2	2	2	3	—	—	3	4	4	5	3	—
Pyrenone 100	—	—	—	—	—	10	5	—	—	—	—	—	5
DDT (aerosol grade)	5	3	3	3	1	1	2	—	1	1	3	2	2
Benzene hexachloride, gamma isomer	—	—	—	—	—	—	—	2	—	—	—	—	—
Cyclohexanone	5	5	—	—	—	—	—	—	—	—	—	—	—
Velsicol	5	—	—	—	—	—	—	—	—	—	—	—	—
Xylene	—	—	—	—	—	—	—	—	—	—	5	8	6
Deodorized kerosene	—	—	—	—	—	—	—	—	8	12	—	—	—
Pentane	—	—	—	—	15	15	—	—	15	15	—	—	—
Lubricating oil No. 30	—	5	—	—	—	—	—	—	—	—	—	—	—
APS-202 (filtered)	—	—	15	12	—	—	11	10	—	—	7	—	—
Sesame oil	—	—	—	—	8	—	—	—	—	—	—	—	—
Acetone	35	—	—	—	—	—	—	—	—	—	—	—	—
Freon-12	—	85	80	83	73	74	82	85	72	68	80	—	—
Freon-142	—	—	—	—	—	—	—	—	—	—	—	87	87
Methyl chloride	50	—	—	—	—	—	—	—	—	—	—	—	—

Materials and Procedure

THE composition of the basic aerosols used in these studies is given in table 1. Most of the stabilizers were added in the proportion of 1 per cent by weight, although in some of the tests with formula 65 other proportions were used. The stabilizer replaced an equivalent proportion of liquefied gas in the basic formula. The sodium carbonate and sodium bicarbonate were used on strips of filter paper (¼ by 3 inches), which were soaked in saturated solutions of these salts and dried at 100° C. overnight.

The apparatus and procedure were substantially the same as were used in the earlier tests (5). Commercial materials were used without further drying, although care was taken to prevent any additional moisture from entering into the experiment. The formulations were made up in the pressure test tubes with a metal test strip in the solution. These test tubes were then placed in a thermostatically controlled oven set at 60° C., and were taken out for examination every other day. The tests were terminated as soon as sufficient data were obtained. In general, this was when the solution decomposed or the metal strip showed corrosion.

* Much of the work described herein was carried out under a transfer of funds, from the Office of Scientific Research and Development recommended by the Committee on Medical Research, to the Bureau of Entomology and Plant Quarantine

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Table 2.—Various stabilizers tested with an agricultural aerosol formula (No. 65).

Stabilizer	*Per cent by weight*	*Days under test*	*Condition at end of test*
None	—	2	Solution decomposed
None	—	3	
Propylene oxide	0.25	10	
Proplene oxide	1	43	No change
3,4-Epoxy-1-butene	1	41	
Alkyl glycidyl ether	2	36	
Ethyl butyl glycidyl ether	3	36	
Phenyl glycidyl ether	3	36	
Diglycidyl ether	1	36	
Hexamethylenetetramine	1	12	Solution turned dark
Methylaniline	1	8	Precipitate on strip
Dimethylaniline	1	7	Crystals covered strip
N-Amylaniline	1	7	Solution decomposed
Sodium carbonate	(1)	24	
Silica gel (activated)	1	17	
Charcoal (activated)	1	13	
Calcite crystals	1	8	Crystals on strip

[1] One strip of impregnated filter paper.

For the rapid evaluation of stabilizers, an agricultural aerosol formula (No. 65 in table 1) was used as an indicator. The acetone in this formula contains some moisture, which, in the presence of methyl chloride and DDT, causes failure within 2 or 3 days under accelerated-aging-test conditions (table 2). This is in striking contrast with other formulas reported in table 3, one of which, for instance, showed no decomposition for as long as 5 months.

All tests were run in duplicate, an average of the two was taken, and the results are given in tables 2 and 3. The value of the stabilizer is directly proportional to the time the formula could be held at 60° C. without failing.

Discussion of Results

IN the tests with formula 65 (table 2) the only variation in the formula was the stabilizer. The results show that as little as 0.25 per cent of propylene oxide had some stabilizing effect, whereas 1 per cent prevented failure for 43 days. At the end of that period there was no apparent change, but the methyl chloride could no longer be held with the Neoprene washers and the test was discontinued. Propylene oxide has been found to be somewhat toxic to animals[1], but when used in such small amounts there should be little danger.

Other epoxy compounds, such as 3,4-epoxy-1-butene, alkyl glycidyl ether, ethyl butyl glycidyl ether, phenyl glycidyl ether, and diglycidyl ether, were found to be good stabilizers, but like propylene oxide they are slightly toxic.

Sodium carbonate worked well with the agricultural formula, No. 65, stabilizing it for 24 days, but when tried with formula No. 343, which contains pyrethrum extract, it caused polymerization of the pyrethrum and could not be used. Sodium bicarbonate also caused polymerization of the pyrethrum but not so readily. The fact that sodium carbonate acts as a stabilizer indicates clearly that elimination of free hydrochloric acid is the important requirement.

Other materials were found to have some stabilizing effect on this formula, but did not appear promising. Although amines were tried in this formula with methyl chloride, they probably combined too rapidly with it to give a stabilizing action.

Of the stabilizers tried with the other aerosol formulas (table 3), propylene oxide proved to be excellent, even when copper and iron strips were used together (No. 305), a combination that ordinarily fails quickly. Other epoxy compounds were tried with No. 305 and were found to be equally as good as propylene oxide. Dicyclohexylamine, pyridine, ethylaniline, and N-mono-*n*-butylaniline were not good, because precipitates, tar, and color formations occurred.

In another basic formula containing cyclohexanone (No. 179) tar was formed. Both aluminum and stainless-steel strips were used with this formula, and they held up longer than with No. 305, in which aromatic petroleum solvent (APS-202) was used. When an iron strip was used in No. 305, the test ran for only 23 days. One test with this formula was set up in which slightly corroded iron strips were used, and failure took place within exactly the same time as with the polished strip. Four formulas (Nos. 179, 199, 350, and 351) were set up, with no metal strips, and it was learned that changes in the solution do take place which are not due to the metal. The most decided change occurred in formula 179, in which a definite tarry deposit appeared.

A test with formula 343, in which tin strips were used, remained stable for 170 days.

Also on test are two low-pressure aerosol formulas, using chlorodifluoroethane (Freon-142) as the propellant, which have been running for 27 days without change.

Formula 338, in which benzene hexachloride was used in place of DDT, kept for 58 days without a stabilizer. It must be kept in mind that this work is not conclusive, and that more extensive research is required. Pyrenone 100 (a mixture of pyrethrum extract and piperonyl cyclohexenone), used in formulas 335 and 337, tended to keep longer than pyrethrum extract in these tests.

Failures apparently result from conditions caused by the liberation of hydrochloric acid. This can be controlled by the addition of less than 1 per cent of propylene oxide. Since 0.25 per cent of this compound has some stabilizing effect on the agricultural aerosol formula, a safe assumption would be that a formula which will last for as long as 90 days without a stabilizer would last almost indefi-

[1] According to P. A. Neal, of the U. S. Public Health Service.

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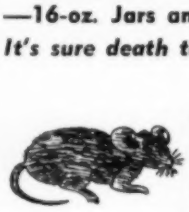

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nately with 0.5 per cent of propylene oxide. Some other epoxy compounds are also excellent stabilizers, and these are being further investigated.

When failure occurs, there is usually little or no corrosion of the metal, but general decomposition with the formation of black tars. The kind of metal determines the rate of decomposition.

Summary

IN further accelerated-aging tests on insecticidal aerosol solutions, stabilizers to prevent failure in storage were tested rapidly by incorporating them in an agricultural aerosol formula that fails within 2 or 3 days without a stabilizer. Some of the best stabilizers were then tested in other aerosol formulations.

The most outstanding stabilizers were the epoxy compounds. Sodium carbonate on filter paper also inhibited failure in solutions in which DDT was the only insecticide used, but caused polymerization of pyrethrum in other formulas. Amines caused coloration and tar formation. Aerosol solutions containing DDT were best stabilized by substances that removed any liberated hydrochloric acid, but did not render the solution alkaline.

Various metals were tested, such as tinned iron, aluminum, stainless steel, copper and iron together, and iron alone. Most of the tests were made with strips of slightly corroded iron, in order to simulate practical conditions.

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Table 3.—Effect of various stabilizers on other aerosol formulas.

Formula	*Stabilizer*	*Kind of Metal Strip*	*Days Under Test*	*Condition of End of Test*
179	None	Aluminum	60	Tarry deposit
	Propylene oxide	Aluminum	120	No change
	None	Stainless steel	44	Tarry deposit
	None	None	30	Tarry deposit
199	None	None	30	Slight precipitate
305	None	Iron	23	Tarry deposit
	None	Iron (slightly corroded)	23	
	None	Aluminum	39	
	None	Stainless steel	32	Heavy precipitate
	Propylene oxide	Iron	125	No change
	Alkyl glycidyl ether	Iron	120	
	Ethyl butyl glycidyl ether	Iron	120	
	Phenyl glycidyl ether	Iron	120	
	Diglycidyl ether	Iron	120	
	Propylene oxide	Copper + iron	160	Dark coloration
	Dicyclohexylamine	Iron	17	Sandy precipitate
334	None	Iron	81	No change
335	None	Iron	42	Tarry deposit
337	None	Iron	35	Dark precipitate
338	None	Iron	58	Tarry deposit
343	None	Tin	150	No change
	Sodium carbonate	Iron	10	Polymerization
	Sodium bicarbonate	Iron	19	
	Pyridine	Iron	20	Heavy tar deposit
350	None	None	120	Slight turbidity
351	Ethylaniline	Iron	5	Solution very dark
	N-mono-*n*-butylaniline	Iron	5	Heavy tar deposit
	None	None	30	Precipitate formed
353	None	Iron	55	Solution very dark
354	None	Iron	55	Solution very dark

Temperature Effect

Exposure of mosquitoes to DDT-treated cages at 70 and 90 or 95°F. resulted in higher knockdown and kill at the higher temperatures. Retention of the insects at 70, 80, and 90°F. after exposure, resulted in the highest knockdowns and kills at the lowest temperature. Retention of bedbugs at 70°F. after exposure at the same temperature produced higher mortality than retention at 80 or 90°F. A. W. Lindquist, A. H. Madden and H. O. Schroeder. *J. Kansas Entomol. Soc.* **19,** 13-15 (1946).

Fungistatic Vapors Tested

Forty-seven chemicals were tested for their effectiveness in vapor phase in controlling molding of materials in closed containers. The testing was done during the war in response to a request for fungus-inhibiting measures needed for military supplies and equipment for which treatment with preservative solutions would be impracticable. As indicated by trials on wood, leather, malt-agar, and pressure tape, some of the most promising compounds were benzaldehyde, 2-chloropyridine, ethyl mercuric chloride, and ortho-chlorphenol. T. C. Scheffer and C. G. Duncan. *Ind. Eng. Chem.* **38,** 619-21 (1946).

DDT Ingestion

Experimental rats were fed diets containing 100 to 1200 p.p.m. of DDT for periods ranging from 6 months to 2 years. At 800 to 1200 p.p.m. rats showed characteristic symptoms of poisoning which terminated fatally in some cases. As far as storage in the fatty tissues was concerned, no distinction was seen between the para, para and the ortho, para isomers of DDT. E. P. Lang and O. G. Fitzhugh. *J. Pharmacol.* **87,** 18-23 (1946).

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ROACH POWDER TESTS

A comparison of the toxicity to roaches of four common ingredients of roach powders, sodium fluoride; pyrethrum, DDT and the gamma isomer of benzene hexachloride

By E. R. McGovran and P. G. Piquett

Bureau of Entomology and Plant Quarantine, U.S.D.A.

THE toxicity of roach powders has been the subject of much discussion. Various methods of testing have been employed and found to show differences in toxicity. In this study four materials known to be highly toxic to roaches were tested in powder form against American and German roaches (*Periplaneta americana* (L.) and *Blattella germanica* (L.)). The first three materials, sodium fluoride, pyrethrum, and DDT, have frequently been discussed in insecticide publications; and the last one, the gamma isomer of benzene hexachloride, was recently reported as toxic to cockroaches and other insects and mites.[1]

Insecticides Tested

A commercial grade of sodium fluoride roach powder (95 per cent sodium fluoride) was tested undiluted. A pyrethrum concentrate, containing 16.44 grams of pyrethrins (55 per cent pyrethrin I and 45 per cent pyrethrum II) per 100 milliliters, was dissolved in acetone and mixed with an insecticide grade of fuller's earth. The acetone was then evaporated and the powder passed through a 200-mesh sieve. The technical DDT (m.p. 90° C., 75 per cent para-para' isomer) and gamma-benzene hexachloride[2] [gamma-1,2,3, 4, 5, 6-hexachlorocyclohexane] (m.p. 111-113° C.) powders were prepared in the same manner as was the pyrethrum. The sample of gamma-benzene hexachloride had a slight odor. The concentration of toxicants and the *dosage* used are given in table 1.

Table 1.—Tests with various toxicants in powder form on roaches

Toxicant	Tests on American roaches (15 roaches used per test)					Tests on German roaches (60 roaches used per test)				
	Concentration of active ingredient	Dosage per test	Knock-down in 1 hr.	Knock-down plus mortality in 1 day	Mortality in 10 days	Concentration of active ingredient	Dosage per test	Knock-down in 1 hr.	Knock-down plus mortality in 1 day	Mortality in 4 days
	%	Milligrams	%	%	%	%	Milligrams	%	%	%
Gamma-benzene hexachloride	2	60	57	74	78	1	24	41	72	73
		25	8	11	13		8	1	6	16
DDT	1	45	2	5	56	10	18	26	71	76
		25	0	2	15		6	2	12	23
Pyrethrins	0.6	30	90	24	79	1.5	24	99	89	76
		10	23	4	15		8	73	56	36
Sodium fluoride	95	30	0	15	71	95	15	3	39	83
		10	0	6	32		5	0	13	40

Table 2.—Dosage of toxicant causing 70 per cent mortality of American roaches 10 days, and of German roaches 4 days, after treatment.

Toxicant	American roaches		German roaches	
	Per roach	Per gram of roach	Per roach	Per gram of roach
	Micrograms	Micrograms	Micrograms	Micrograms
Gamma-benzene hexachloride	72	69	3.6	31
DDT[1]	37	36	25	217
Pyrethrins	10.8	10.4	5	43
Sodium fluoride	1833	1763	158	1375

[1] As data on the relative toxicity to roaches of the isomers of DDT are not at hand, the killing effect is assumed to have been caused by all the constituents of the DDT and the figures are based on the total DDT used rather than just the para-para' isomer present.

Insects Tested

Adult female American roaches and German roaches were used in the tests. These insects were laboratory-reared and of varying age. Cultures were divided into uniform groups, and these groups were used in the comparisons between materials. The average weight of individual American roaches was 1,040 mg., and of individual German roaches, 115 mg.

Method

The insects were confined with the insecticide in glass crystallizing dishes. The desired amount of insecticide was weighed out on a watch glass on an analytical balance. The powder was scattered from the watch glass over a circle 4⅜ inches in diameter

[1] Slade, Roland. 1945. A new British insecticide, the gamma isomer of benzene hexachloride. *Chem. Trade Jour. & Chem. Engin.* 116: 279-281.

[2] Sample supplied through the courtesy of A. King, of the British Commonwealth Scientific Office, Washington, D. C.

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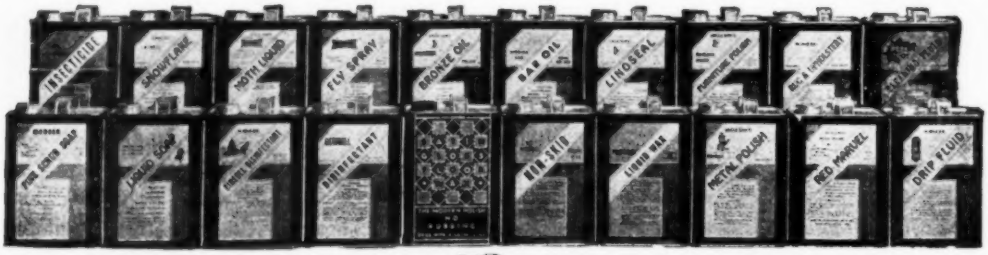

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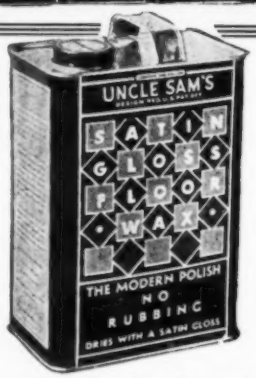

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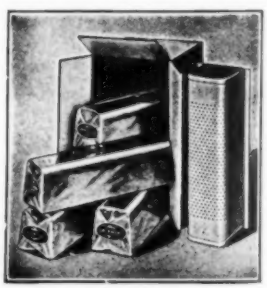

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in the center of the bottom of a 9-inch glass crystallizing dish. The material was transferred and scattered uniformly over the circle with a camel's-hair brush. To prevent an appreciable amount of powder from adhering to the brush, all but two or three hairs were clipped from the brush.

A glass crystallizing dish 4⅜ inches in diameter (outside measurement) was then inverted over the dusted area. This formed an insecticide-free circle about 1½ inches wide between the two dishes. The walls of the dishes were covered near the top with a thin coat of heavy white mineral oil to prevent the roaches from escaping. A cotton-stoppered vial of water and two or three dog biscuits were added. The roaches were then released in the insecticide-free area and allowed to quiet down. When the insects had become accustomed to the dish, so that their activity was normal, the inverted crystallizing dish in the center was gently removed. In this manner the insects were exposed to the treated area without any strong stimulation that might force them into the powder in an abnormal manner. They entered the treated area of their own volition and at a pace also of their own choice.

Many preliminary tests were made to determine the amount of powder and the number of insects that should be used per test. Owing to the time and labor needed to produce a stock of roaches for insecticide testing, it was desirable to use as few insects as possible. On the other hand, it seemed advisable to use the insecticide in a form similar to that used in practice. As the commercial grade of sodium fluoride is often used undiluted, the minimum dosage and the number of insects were based on this material. As weighings of less than 5 mg. would involve a considerable percentage of error in weighings and loss in distributions, this amount was taken as the minimum dosage. With this dosage kills below 50 per cent were obtained with 15 American or 60 German female adult roaches. As too much powder would be scattered by the roaches from the circle in the center over the entire bottom of the crystallizing dish, a maximum of 60 mg. of powder was chosen as the upper limit of the dose per crystallizing dish. This dosage of fuller's earth had no visible effect on the number of roaches used in the tests. Ten times this amount caused slight mortality among American roaches but none among German roaches.

The insects were held at 70° F. and 70 per cent relative humidity during the tests. Mortality and knock-down counts were made 1 hour after treatment and on the first, second, and alternate days thereafter until the tenth day for American roaches; and on the first, second, and fourth days for German roaches. Roaches that could move their appendages but were unable to crawl were considered as knocked down. Knock-down and mortality percentages in table 1 are the average of three tests each.

Results

The pyrethrum caused the highest knock-down of German roaches in 1 hour, followed by gamma-benzene hexachloride and DDT in turn. Sodium fluoride caused practically no knock-down in 1 hour. The 1-day knock-down plus kill rose above the 1-hour knock-down with all materials but pyrethrum, which was slightly lower. The final mortality observed on the fourth day was approximately equal to the 1-day observation of knock-down plus mortality for gamma-benzene hexachloride and for DDT, was somewhat lower for the pyrethrum, and had doubled for the sodium fluoride.

One hour after treatment the high dosage of pyrethrum had knocked down most of the American roaches, and the gamma-benzene hexachloride had knocked down slightly over half of them. DDT and sodium fluoride had caused practically no knock-down. One day after treatment the gamma-benzene hexachloride had caused a combined knock-down and kill of three-fourths of the insects, but many that had been knocked down with pyrethrum had at least partially recovered so that only one-fourth were down or dead. At this time DDT and sodium fluoride were just beginning to incapacitate some of the insects.

In table 2 are given the dosages of the four toxicants required to kill 70 per cent of the roaches. These figures were obtained by free-hand plotting of the final mortality data given in table 1 on probit-log paper and calculation. The 70 per cent mortality level fell between the high and low kills in all cases except the DDT tests on American roaches. In these tests the curve had to be extended above the mortalities determined to reach the 70 per cent mortality level.

It is of interest to note that in every instance more toxicant was required to kill an individual American roach than an individual German roach. This is to be expected, as the former weighs between eight and nine times as much as the latter. There is, however, a range between toxicants in the amount needed to kill individuals of the two species. About 11.6 times as much sodium fluoride, 1.5 times as much DDT, twice as much pyrethrins, and 20 times as much gamma-benzene hexachloride is needed to kill an individual American roach as is needed to kill an individual German roach at the 70 per cent mortality level.

Gamma-benzene hexachloride was the most toxic to German roaches per gram of body weight of roach, but was third in toxicity to the American roaches. Pyrethrins ranked first on American roaches and a fairly close second on German roaches. DDT was placed second on American roaches and third, by a wide margin, on German roaches. Sodium fluoride was the least toxic to both species on this basis.

Summary

Tests of toxicity to American and German roaches of four toxicants in powder form were made in crystallizing dishes in the laboratory. Pyrethrum caused the highest knock-down, gamma-benzene hexachloride caused medium knock-down, DDT slight on German roaches and practically none on American roaches, and sodium fluoride practically no knock-down in 1 hour.

(*Turn to Page* 181)

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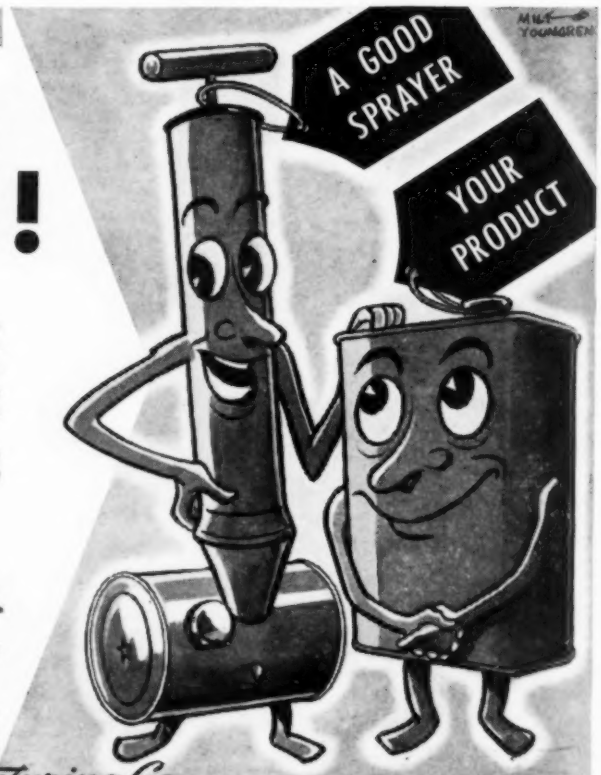

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eliminating neutralizing compounds. This system is preferred but frequently we encounter two-tank sinks. Inasmuch as both chlorine and cationics are neutralized by organic matter, we were interested in determining the effect of carry-over of wash water into the sanitizing tank on bacterial kill. Accordingly a restaurant with a two tank sink was selected for study. The testing was done in the same manner as before.

In the first series of tests the glasses were washed in running water without any detergent or brushing and then rinsed in a cationic solution (1-6400). The data are presented in Table 8. Three glasses exceeded a count of 100 bacteria. One of these glasses had lipstick on the rim after washing. The remaining glasses were satisfactory.

TABLE 6

Sanitization of beverage glasses. Number of bacteria on rims of glasses immediately after dipping into chloramine T. (180 p.p.m.—5 gal. water) (glasses washed and rinsed as in Table 1).

Glass No.	Bacteria Count	Glass No.	Bacteria Count
10	100	360	450
20	230	370	400
30	230	380	300
40	80	390	600
50	260	400	610
60	690	410	440
70	210	420	580
80	110	430	420
90	210	440	660
100	530	450	260
110	50	460	300
120	280	470	830
130	420	480	840
140	230	490	550
150	670	500	670
160	220	510	720
170	360	520	640
180	420	530	500
190	350	540	770
200	450	550	760
210	480	560	750
220	870	570	860
230	150	580	1100
240	550	590	1700
250	510	600	910
260	350	610	790
270	550	620	1200
280	610	630	1100
290	980	640	1100
300	1500	650	570
310	510	660	750
320	340	670	1100
330	260	680	1200
340	70	690	1600
350	430	700	1400

In the next series the glasses were washed in "Solvay 600" and immediately rinsed in a cationic solution (1-6400). The detergent used was selected because it contains detergent materials which neutralize cationics. The data presented in Table 9 show that 700 glasses were properly sanitized. Three glasses, apparently improperly washed showed counts in excess of 100 bacteria.

In a third series, the glasses were washed with a cleaner containing hexa phosphate. Hexa phosphate neutralizes cationic compounds so that a carry-over of the wash water should destroy the germicidal value of the cationic compound. In these tests 800 glasses were tested. The results were similar to previous tests. At the end of 800 glasses the sanitizer was still active.

To obtain a comparative picture, hypochlorite was also tested in a two tank system. The results on a 800 glass test were similar to those of the cationics.

TABLE 7

Sanitization beverage of glasses. Number of bacteria on rims of glasses immediately after dipping into quaternary ammonium chloride solution (1 oz. 10% solution in 5 gal. water). (Glasses washed and rinsed as in Table 1).

Glass No.	Bacteria Count	Glass No.	Bacteria Count
10	0	360	0
20	0	370	0
30	0	380	0
40	0	390	0
50	0	400	0
60	0	410	0
70	0	420	0
80	0	430	0
90	30	440	0
100	0	450	10
110	0	460	0
120	0	470	0
130	0	480	0
140	0	490	10
150	0	500	0
160	0	510	30
170	0	520	10
180	0	530	0
190	0	540	10
200	0	550	10
210	0	560	0
220	0	570	0
230	0	580	20
240	10	590	10
250	0	600	0
260	0	610	20
270	0	620	20
280	0	630	0
290	10	640	0
300	0	650	0
310	0	660	0
320	20	670	0
330	10	680	20
340	10	690	0
350	0	700	0

Summary

A NEW technic, the speed reaction test, demonstrated that cationics have marked rapidity of action in high dilutions on both Gram positive and negative bacteria.

The phenol coefficient, the use-dilution technic, and the wet filter paper technic do not in any way show that cationics would be good beverage glass sanitizers. The speed-reaction test was found to show the applicability of cationics for beverage glass sanitization.

Field testing, using 400 to 800 glasses, showed that 5 gallons of hypochlorite (180 p.p.m. available chlorine) or cationics ("Roccal," "B.T.C.," "Hyamine 1622") 1-6400 would sanitize 800 glasses effectively with an exposure of approximately 30 seconds.

The presence of neutralizing agents in the cleaners (wetting agents and polyphosphates) had no effect on the sanitizing value of cationics when 800 or less glasses were sanitized using both 2 and 3 tank systems of washing and sanitizing.

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(7) U. S. Public Health Service. Ordinance and Code Regulating Eating and

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Drinking Establishments. Public Health Bull. 280.

(8) Devereux, E. D. and W. L. Mallmann. Studies of the technic to evaluate the efficiency of several chlorine sterilizers for dairy use. Jour. Dairy Sci. 17:351, 1934.

TABLE 8

Sanitization of beverage glasses. Number of bacteria on rims of glasses immediately after dipping into quaternary ammonium chloride solution (1 oz. 10% solution in 5 gal. water). Glasses washed in cold running water and immediately rinsed in sanitizing solution.

Glass No.	Bacteria Count	Glass No.	Bacteria Count
10	10	210	0
20	0	220	10
30	90	230	0
40	210	240	510
50	0	250	0
60	0	260	0
70	10	270	0
80	0	280	20000
90	10	290	10
100	0	300	0
110	0	310	0
120	30	320	20
130	0	330	10
140	0	340	10
150	0	350	30
160	0	360	10
170	0	370	0
180	0	380	0
190	0	390	0
200	0	400	0

TABLE 9

Sanitization of beverage glasses. Number of bacteria on rims of glasses immediately after dipping into quaternary ammonium chloride solution (1 oz. 10% solution in 5 gal. water). Glasses washed in solvay 600 and immediately rinsed in sanitizing solution.

Glass No.	Bacteria Count	Glass No.	Bacteria Count
10	0	360	40
20	10	370	10
30	0	380	0
40	0	390	0
50	0	400	0
60	0	410	0
70	10	420	10
80	10	430	0
90	10	440	10
100	0	450	20
110	10	460	0
120	0	470	30
130	0	480	0
140	3960	490	0
150	10	500	30
160	1200	510	0
170	500	520	0
180	10	530	0
190	60	540	0
200	0	550	10
210	0	560	30
220	0	570	0
230	0	580	10
240	50	590	0
250	30	600	20
260	0	610	0
270	0	620	0
280	0	630	0
290	10	640	60
300	0	650	20
310	0	660	20
320	20	670	0
330	0	680	0
340	0	690	0
350	0	700	0

QUATERNARY AMMONIUMS

(*From Page* 149)

comparison of anti-bacterial agents so utterly unrelated in character and mode of action.

Summary and Conclusions

CONTINUING the work on the comparative testing of quaternary ammonium compounds, we arrived at the following results:

(1) Extension of the previously reported experiments with *Eb. typhosa* to other Gram-negative microorganisms (*Es. coli, Sh. paradysenteriae*) confirms and supplements our conclusion that the original F.D.A. method furnishes an erroneous idea regarding the disinfectant potency of four quaternary ammonium compounds and of a long-chain alkylamine, as conveyed either by the minimum germicidal concentrations effective in ten minutes at room temperature, or by the phenol coefficients calculated therefrom.

(2) The "filter paper" or "semi-micro" technic allows a more proper evaluation of the disinfectant performance of the four quaternary ammonium compounds and of the alkylamine tested, and shows it to be considerably lower than claimed hitherto.

(3) The four quaternary ammonium compounds displayed a very marked bacteriostasis with respect to *S. aureus* which requires a suitable modification of the "filter paper" technique involving the use of serum as a means of suppressing bacteriostasis.

(4) The germicidal action upon *S. aureus* of the four quaternary ammonium compounds and of the long-chain alkylamine is substantially lower than claimed, and lower than indicated by the original F.D.A. method; a less pronounced lowering of the germicidal action of certain phenolic disinfectants was also observed under the conditions of the "filter paper" method.

(5) Tests with a hemolytic strain of streptococcus yield a picture which is similar to that obtained with *S. aureus*.

(6) Strips of glass or steel contaminated with a *dried* smear of *S. aureus* were not disinfected by a commercial 1:1000 dilution of a quaternary ammonium compound in ten minutes at 20° C, although a 1:60 or 1:70 dilution of phenol accomplished the disinfection.

Reference is made to the economic disservice rendered to the position of other disinfectants by attributing to the quaternary ammonium compounds substantially greater germicidal powers than actually possessed by them.

Reference

[1]E. G. Klarmann and E. S. Wright; *Soap and Sanitary Chemicals*, Jan., 1946.

Brit. DMP Insect Repellent

A new insect repellent originally developed in England by the scientific advisory committee of the Department of Health is now being offered on the English markets. The repellent, when prepared in the form of a lotion of 5 gms. lanette wax SX; 9 c.c. triethanolamine; 27 c.c. oleic acid; 100 c.c. dimethylphthalate; and 100 c.c. water, is claimed to offer protection from insects, particularly midges, for at least two hours, and to be harmless to the skin. The lotion should not be brought into contact with tortoise shell or plastic spectacle frames. Several British firms are now producing this product. Burroughs Wellcome & Co., London, is now marketing such a repellent in capsule form under the trade name of "Sketofax." *Mfg. Chem.* 17, June 1946.

Seed Disinfectant

A toxic quantity of 1,2-dibromo-1,2-dithiocyanoethane is applied to seeds to control organisms carried by them. Wm. Moore, to Am. Cyanamid Co. Canadian Patent No. 433,236.

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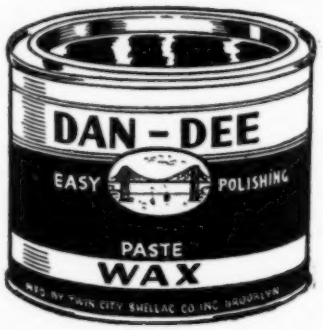

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TRADE NEWS . . .

Lehn & Fink Sales Meeting

The semi-annual divisional sales meeting of Lehn & Fink Products Co., New York, was held during the first week of July at the Morrison Hotel in Chicago. About fifteen sales people attended. Distribution plans for the coming year were drawn up and an incentive bonus plan for salesmen was discussed.

New DDT Powder Gun

Chemical Supply Co., Neenah, Wis., is marketing through retail hardware stores a new DDT insect powder gun, in 4-oz. or 1-lb. size. To operate, a small wheel at top of gun is adjusted so the opening appears. Then the lower half of the gun, which telescopes into the upper half, is moved forward to create air pressure which expels the powder.

New Powell Insecticides

Two new insecticides were placed on the market last month by John Powell & Co., New York. "Pyrin 'D' 20" is used for the preparation of general purpose insecticides, and when diluted one part with nineteen parts of base oil, gives a finished space spray containing 3 per cent "Pyrin" and 1 per cent DDT. The knockdown of the new product is claimed to be equivalent to that of 5 per cent straight pyrethrum extract. Another new product, "Pyrin 'R'," is for the preparation of a residual-type spray where knockdown is a required factor. "Pyrin 'R' " should be diluted one part to four parts base oil to give a product containing 5 per cent of DDT and 2 per cent of "Pyrin."

Heads Velsicol Sales

Velsicol Corp., Chicago, announces the appointment of Noble L. Mooneyham as western district sales manager for the complete line of Velsicol products, which includes insect toxicants, methylnaphthalene solvents, aromatic petroleum solvents, hydrocarbon resins and core oils. Mr. Mooneyham will also continue in charge of nation-wide core oil sales. He has been an active member of the

N. L. MOONEYHAM

Chicago Chapter of the American Foundrymen's Association for many years and joined Velsicol in 1935, serving in an executive capacity since 1938.

Electric Moth Fumigant

Clean Home Products, Inc., 1401 W. North Ave., Chicago, is offering dealers a new electric moth fumigator, described as consisting of a porcelain and metal container which holds a 30-day supply of P.D.B., and an electric cord for plugging into an outlet. Operation of the mechanism causes vaporization of the fumigant, it is explained. "Fumicakes" for refills are also available, the company announced.

WAA Sells Repellent

More than ten million two-ounce bottles of insect repellent have been disposed of since March by the War Assets Administration, it was learned recently. Another sixteen million bottles have been set aside for sales to war veterans. The balance of the inventory, about fifty-four million bottles, is now being offered to wholesalers and retailers. The minimum quantity to wholesalers is forty cases at five cents a bottle. The bottles are packed 108 to the case. Small retailers may purchase 10 cases at 7½ cents a bottle and large retailers 50 cases at 7 cents a bottle. All of the 33 regional offices of the WAA will accept orders.

Matco Midget Aerosol

Matco Products, Inc., Jersey City, N. J., has placed on the market a new "Matco" midget aerosol bomb, containing 5 per cent DDT and 1 per cent pyrethrum, for one-time use in rooms up to 5,000 cu. ft. Retail price is set at three bombs for 50 cents.

Theis Hopkins Co. Pres.

Louis Theis was elected president of J .L. Hopkins & Co., New York, drug importers, on July 18th, following the death of Jesse L. Hopkins, founder of the company 56 years ago. Mr. Theis has been with the company 47 years and prior to his election had served as vice-president. E. I. Hopkins, son of the founder, will take over as vice-president.

Drinking Glass Sanitizer

Sethness Products, Inc., 1300 W. Division St., Chicago, has announced a new tasteless and odorless sanitizing agent, "S P-25," for use as a detergent at high or low temperatures and useful for washing drinking glasses and food containers.

Du Pont Insecticide Plant

A pilot plant for limited production of their new insecticide, hexachlorocyclohexane, is in operation at the Du Pont Company plant at Grasselli, N. J. Commercial introduction of the new product will not be attempted until it can be tested and compared with existing insecticides under conditions encountered in the American market. The new compound, sometimes called benzene hexachloride was developed by Imperial Chemical Industries of England under the trade name of "Gammexane," and was tested in England and Africa during the war.

Lindenfelser Dies

The death of A. M. Lindenfelser, secretary of American-British Chemical Supplies, Inc., New York, was announced in July by the company.

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New NAIDM Members

NAIDM recently announced the election to active membership in the association of the following firms: Cities Service Oil Co., Chicago; Eston Chemical Inc., Los Angeles; D. H. Litter Co., Inc., New York; Matco Products, Inc., Jersey City; Neville Corp., Pittsburgh. Elected to associate membership were: Glyco Products Inc., Brooklyn; Universal Metal Products Co., Saranac, Mich.

New Aerosol Insecticide

A new five-pound aerosol unit, the "Mul-T-Vapor", for controlling insects in greenhouses, dairy farms, restaurants, mushroom houses, private estates, ranches, camps, airlines, steamships, food packers, summer resorts, etc., has been introduced by Edco Corporation, manufacturers of Mul-T-Products, Newark, Delaware. The new bomb, with a capacity of from 750,000 to 1,250,000 cubic feet, is claimed to last five times as long as the average aerosol bomb, is refillable, and formulated either with or without DDT. The "Mul-T-Vapor" is equipped with a handle grip for easy use and can be carried by hand or suspended from ceilings with heavy cord. Its spray mist of DDT and pyrethrum extends as far as eight feet. Larger sizes of the bomb are expected to be in production shortly.

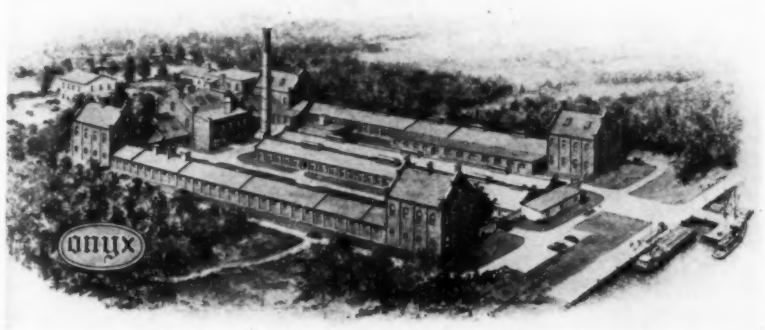
New Powell Products

John Powell & Co., New York, have recently announced two new insecticide base products. "Powco Brand Pyrin R", an insecticide concentrate for use in the manufacture of residual type DDT sprays, has been pre-blended and chemically standardized to produce a finished spray containing 5 per cent of DDT and 2 per cent of "Pyrin No. 20" when diluted one part "Pyrin R" plus four parts base oil. At the recommended dilution, the finished spray is claimed by the company to have a knockdown equivalent to the official test insecticide on flies and the presence of 5 per cent DDT is claimed to assure essentially 100 per cent kill of flying and crawling household insects.

"Powco Brand Pyrin D20", a general purpose insecticide concentrate giving a finished spaced spray containing 3 per cent of "Pyrin No. 20" and 1 per cent of technical grade DDT when diluted at one part "Pyrin D20" plus 19 parts base oil, is claimed by the company to give a knockdown on flies equivalent to a 5 per cent pyrethrum extract plus practically 100 per cent kill. Both new products can be blended with the base oil by simple mixing methods and do not require special weighing or mixing equipment, auxiliary solvent, etc. Technical bulletin, popular bulletin and samples are available from the company upon request.

Onyx Oil Expands

Onyx Oil & Chemical Co., Inc., Jersey City, manufacturers of textile and leather chemicals, synthetic organic detergents, wetting agents and cationic germicides, acquired a new plant, in July, at St. Charles, Staten Island, N. Y., and was expected to be ready for production about the first of August. The new plant, located on an 8 acre plot, has its own water supply and dock facilitites. Resin emulsions, quaternaries and alkyl napthas are to be manufactured as well as other products now being made at the Jersey City plant.



Lederer Joins Hollingshead

Appointment of Dr. H. G. Lederer as director of the biological laboratories of R. M. Hollingshead

DR. H. G. LEDERER

Corporation, Camden, N. J., was recently announced. Winner of the Distinguished Service Medal for his work in malaria control, Dr. Lederer was placed on the Army's inactive list early this year with the rank of Lt. Colonel. For ten years prior to the war he was director of the Lederer bacteriological laboratories, Philadelphia, and specialized in the research and development of disinfectants and insecticide controls. In 1941, Dr. Lederer became a member of the Army's Sanitary Corps with the rank of Lieutenant. He was active in the research and development of DDT and after graduating from the Army School of Malariology, Panama Canal Zone, he was assigned to the Pacific area as sanitary engineer in charge of malaria control units. Upon his return to the United States, he was appointed laboratory director of the Army's Camp Chaffee, Arkansas, Separation Center, retiring from the Army as Lieutenant Colonel in March of this year. In his new capacity, Dr. Lederer will be responsible for the extension of Hollingshead research into the field of bacteria and insect control.

Heckethorn Mfg. & Supply Co., Littleton, Colo., is using national advertising, with display and dealer promotional material in a campaign on behalf of "Bugs Away," a new insect repellant.

TAR ACID OIL

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and

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Unusually High in Tar Acids
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made from
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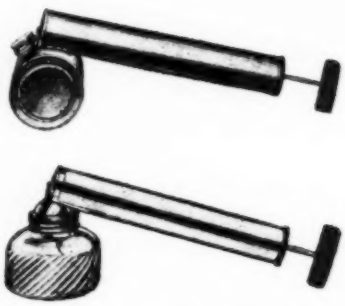

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Decide Thiocyanate Patent

A DECISION favoring Hercules Powder Co., Wilmington, in the patent action involving Hercules, producers of "Thanite" insecticides, and Rohm & Haas Co., Philadelphia, producers of "Lethane" insecticides, was handed down July 9 by District Judge Leahy in the Delaware District Court. Hercules had sued Rohm & Haas, challenging the validity of the Heckert patent (No. 1,808,893 issued June 9, 1931) and charging Rohm & Haas with unfair competition and violation of the anti-trust laws in the sale of "Lethane" products. Rohm & Haas had introduced a counter-charge of trade-mark infringement, claiming that the use of "Thanite" by Hercules infringed its trade-mark rights in "Lethane."

Judge Leahy's decision held the Heckert patent invalid and consequently not infringed by Hercules Powder Co. He ruled that evidence did not support the Hercules charges of unfair competition or violation of antitrust laws, nor did it support the Rohm & Haas counter claim of trade-mark infringement.

In announcing his decision Judge Leahy indicated that he was at first prepared to recognize the validity of the Heckert patent which he described as a "pioneer patent which has been of great assistance to the (insecticide) industry" and "has freed the American insecticide manufacturers from the domination of foreign pyrethrum growers." Two recent decisions in other patent cases compelled him to find the patent invalid, however. The recent case of Minnesota Mining & Manufacturing Co., et al. v. The Carborundum Company, et al., 3 Cir., F. 2d, he said, "teaches that the inventor, when he comes to write his patent, can not describe his invention in general terms which would include many other chemical substances, some of which would carry out the rule of the patent, but many of which could not be thus employed; that is, the inventor can not disclose a small number of compounds which will serve as a springboard for claiming an entire class."

The second decision which Judge Leahy recognized as affecting his own decision in the Heckert patent case was the case, Standard Oil Company of California v. Tidewater Associated Oil Company, 3 Cir., F. 2d. In that case the Judge ruled that "no inventor may compel independent experimentation by others to ascertain in the bounds of his claims."

Powell Marketing ANTU

John Powell & Co., New York, announced last month that they have added the new rodenticide, ANTU, to their insecticide line. The development and testing of ANTU by Dr. Curt P. Richter of Johns Hopkins University was reported in *Soap & Sanitary Chemicals*, September 1945. ANTU, which chemically is the synthetic organic compound, alpha naphthyl thiourea, is a fine grayish powder, insoluble in water, extremely stable, and non-irritating to the skin. Normal temperature changes do not affect ANTU because of its high melting point (183° to 185°C.). It is a highly toxic rodenticide and is particularly effective against the Norway rat. "Powco Brand Antu" is said to be standardized both chemically and biologically and to be readily acceptable to rats in any standard rat bait formula. It can also be used as a contact poison. Technical and popular bulletins and samples will be sent by the company on request.

Pitts Coal Now Disco

Pittsburgh Coal Carbonization Co., Pittsburgh, a subsidiary of the Pittsburgh Consolidation Coal Co., recently reported that its name had been changed to the Disco Company. There was no change in management or personnel.

Nelson Greets Dutch Ship

Henry A. Nelson, president of the Chemical Supply Co., Cleveland, and former president of NAIDM, who is acting Consul for The Netherlands Government in Ohio recently welcomed the first Dutch merchant vessel to arrive at the port of Cleveland since the outbreak of the war. The ship was the *S.S. Prins Maurits* of the Oranje Lijn which inaugurated the resumption of regular sailings between the Netherlands and the Great Lakes. At a luncheon served aboard the vessel in honor of the welcoming committee, officers of the Cleveland Chapter of American Relief for Holland presented three tons of clothing collected in Cleveland for return shipment to Holland for relief of the needy.

Hawaiian Co. Relocates

Kills 'Em Chemical Company, Honolulu, reports that it has moved to a new $100,000 location in the Waikiki area where its new quarters including offices, warehouses, and plant will cover 12,000 square feet of a 30,000 square foot site. Kills 'Em Co. was founded in 1941 by four brothers—George, Louis, Lawrence and Benet Costa, with a capital of $7,500. Today the company has a capital of $100,000 and plans to produce and distribute some 56 sanitary products throughout the Hawaiian Islands, Manila, and Shanghai.

Carnauba Wax Exhausted

There is very little carnauba wax remaining in Brazil from the current crop, according to a market report from Moraes & Cia., Parnahyba, Brazil. They report that exports from September to December, 1945, were 875,191 kilos, and exports from January to June, 1946, totaled 3,249,663 kilos, practically exhausting the 1945-46 crop. They advise that of the new crop approximately 1,000 tons has already been sold for shipment from September, 1946 to February, 1947.

Dick and Cusack Join Enco

Erwin R. Dick and Frank L. Cusack recently joined Enco Chemical Corporation, New York. Mr. Dick has had many years of varied experience in the chemical industry, both here and abroad. He has just returned from an extended trip throughout Europe, where he has been re-establishing Enco's prewar connections and developing new ones. For the past ten years, Mr. Cusack was connected with Westvaco Chlorine Products Corp. in the export division of the sales department. Prior thereto he was associated with Henry W. Peabody & Co., importers and exporters.

C. V. WAX "A"
(Replaces Carnauba)

A. G. BLACK
(Replaces Montan)

DOMESTIC OZOKERITE **DOMESTIC CERESINE**

F. W. STEADMAN COMPANY

59-61 Pearl Street — Waxes of Every Description — New York City

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2,4 Dichlorophenoxyacetic Acid
and
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THE MARK OF QUALITY

PALE WOOD
ROSINS

They will help
the soapmaker
"stretch" his fats.

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for SOAP AND SANITARY CHEMICALS is the

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YOUR COOPERATION IN FURNISHING COPY INSTRUCTIONS
ON TIME WILL HELP US MEET OUR PUBLICATION DATE.

New Cleaner and Wax

Twin City Shellac Company, Brooklyn manufacturers of "Dandee" paste and liquid floor waxes and furniture polish, are now marketing "Welsite", a new combination floor cleaner and wax. "Welsite" cleans and waxes in one operation, thus eliminating the time consumed in washing floors before waxing. It is said to remove surface stains not affected by soap and water and to buff easily to an exceptionally high gloss. The new product will be sold through sanitary supply jobbers.

Smith Returns To Onyx

Onyx Oil & Chemical Co., manufacturers of textile, leather, and industrial chemicals, recently announced that Major Clifford R. Smith, Onyx southern sales representative before his entry into military service, has reopened his office in Atlanta at 231 Healey Building. Major Smith, who served with the Chemical Warfare Service, will now represent Onyx in Alabama, Georgia, Tennessee, Florida, and Mississippi.

Peters Joins Velsicol

Velsicol Corporation has appointed Frank Campbell Peters to its eastern sales staff. Mr. Peters will make his headquarters at the company's eastern offices, in New York, and will handle the company's line of hydrocarbon resins, aromatic solvents, and insect toxicants in the eastern territory. Mr. Peters was recently discharged from the United States Navy, after spending considerable time overseas. Prior to the war, he was active in the paint, varnish, and lacquer industry, having been in the employ of Socony Vacuum Oil Company, Sherwin-Williams, and the Valspar Corporation for a number of years.

Hopkins Dies

Jesse L. Hopkins, eighty-six, president and founder of J. L. Hopkins & Co., New York, died last month. Born in Norfolk, Va., Mr. Hopkins was a descendant of Stephen Hopkins, a descendant of Stephens Hopkins, a signer of the Declaration of Independence. He was an honorary vice-president of the Board of Trade and a member of the Drug and Chemical Club.

Powell Co. 23d Year

John Powell & Co., New York, manufacturers of basic materials for the insecticide industry, celebrated its 23d anniversary the first week of July. The company manufacturers rotenone, sabadilla, pyrethrum, and DDT products under the trademark of "Powco Brand".

NPCA Convention Oct. 28-30

The National Pest Control Association will hold its fourteenth annual convention at the Hotel Roosevelt, New Orleans, October 28, 29, and 30, 1946.

W. C. House Elected

Magar Home Products, Inc., New York, have announced the election of W. C. House as vice-president.

W. C. HOUSE

The company manufactures insecticides, detergents, mothproofers, paint removers, etc. Their plant is located at Cornwall Landing, one the Hudson on the property of the old Fales Chemical Company.

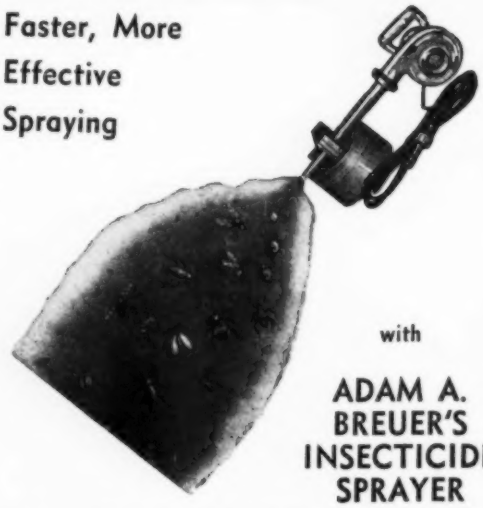
Trumbull New Consultant

Howard A. Trumbull, sales promotion manager of the glass container division of Owens-Illinois Glass Co., Toledo, resigned August 1 to form a consumer research organization which will be known as National Family Opinion, located in the Toledo area. The new concern, organized on the lines similar to the Home Makers Guild of America, will not only obtain facts from consumers, but also apply them to the needs in marketing.

HONOR R. H. de GREEFF

R. H. de Greeff, left, president of R. W. Greeff & Co., New York, being congratulated on the occasion of his fortieth anniversary with the company, by Ira Vanderwater, vice-president. At a supper party at the Netherlands Club, Mr. de Greeff was presented with a Delft plate, made in Holland and specially designed in commemoration of his fortieth anniversary.

Faster, More Effective Spraying



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MOTORIZED spraying of insecticides is not only faster, covering a wider area in less time, but also more effective. Breuer's Insecticide Sprayer is motorized to give more penetrating, more efficient spraying of insecticides, disinfectants, etc. Unit holds up to 1 gallon of liquid and sprays it 18' to 20'. Shoots with such force as to penetrate all cracks and crevices. Extensively used.

We do not sell insecticides. Our business is the manufacture of Sprayers. (Patented in U. S. A. and foreign countries.)

SPRAYER CORPORATION of AMERICA
1812 W. Winona Avenue Chicago 40, Ill.

Licensed to build and distribute Breuer Insecticide Sprayers.

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TO MANUFACTURERS OF PEST CONTROL POWDERS

FOR **DDT** DUSTS

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PYRAX ABB

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The most widely used carrier or diluent in Pest Control Powders

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Warehouse stocks available at strategic points throughout the United States

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YOUR ASSETS and CAPITAL STOCK are WORTH MORE NOW

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For Your

- **INDUSTRIAL PLANTS**
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We are principals acting in our own behalf. All transactions held in strictest confidence. Personnel retained wherever possible.

Address: Box No. 1215
147 W. 42nd St., New York 18, N. Y.

Joins Management Comm.

In a series of shifts made recently in the sales division of S. C. Johnson & Son, Inc., Racine, Wis., R. W. Carlson, sales manager, was made

R. W. CARLSON

a member of the wax manufacturing firm's management committee.

Pyrethrum Analysis Dispute

Analysis of pyrethrum flowers by the original Seil Method as published about ten years ago by Dr. Harvey Seil is the only method now acceptable to the Kenya Farmers' Association, according to recent cable advices to the Green Trading Co., New York. The Seil method as currently used in American laboratories calls for slight modifications of the original Seil technique, the modified method giving lower pyrethrin results by removal of useless oxidized pyrethrins, according to Dr. Seil. The modified method is held to be more accurate, but is also stated to give results of 0.1 to 0.15 per cent pyrethrins lower, and therefore is no longer acceptable by the Kenya growers.

Report Aerosol Tests

The National Association of Insecticide & Disinfectant Manufacturers would appreciate the cooperation of all insecticide manufacturers who are biologically testing aerosols in reporting their test procedure to J. H. Mills, chairman of the NAIDM Aerosol Committee. Mr. Mills may be addressed care of Bridgeport Brass Co., Bridgeport 2, Conn., with a copy of the letter to the Association office. In order to aid in developing a standard test procedure, the following information is requested:

1. Size of room used.
2. Use of caged or free-flying insects.
   a) Description of cage and mesh size, number of cages used, how used, if cages are set on revolving table, whether inclined, vertical, or horizontal, and speed of revolutions.
3. Description of ingredients used in formulation.
   a) Dosage.
   b) Rate of flow.
   c) Droplet size.
4. Description of aerosol spray unit.
   a) If possible, use unit described in *Soap and Sanitay Chemicals*, July, 1945, issue, in which definite measured quantity can be determined and sprayed through a capillary tube 4½" long of 0.016" inside diameter.

S. A. M. Honors McCormick

Charles P. McCormick, president of McCormick & Co., Baltimore, makers of food products and insecticides, has recently been elected vice-president in charge of human relations in the national organization of the Society for the Advancement of Management.

New Aerosol Campaign

Some 131 newspapers with circulation of over 23,000,000 will be used in a promotional campaign for the Westinghouse "Bug Bomb" aerosol insecticide dispenser, according to Roger H. Bolin, advertising manager of the Westinghouse Electrical Appliance div., at Mansfield, Ohio.

New Dairy Insecticides

Three new insecticides for dairy use have recently been announced by Klenzade Products, Inc., Beloit, Wis. The new products include an oil-base spray, a dusting spray, and a cattle spray, each containing DDT and pyrethrum.

Solvay Houston Branch

Solvay Sales Corp. has opened a new branch office at Houston, Tex., with Col. S. O. Taylor in charge. Col. Taylor is a veteran of both World Wars I and II and was formerly at Solvay's St. Louis branch for eleven years.

Major Fellton Joins Orkin

Major Herman L. Fellton, formerly with the U. S. Public Health Service, has been appointed technical

MAJOR HERMAN L. FELLTON

director of Orkin Exterminating Co., Atlanta. During the past five years, Major Fellton has served in the engineering division of the Public Health Service during which period along with his other duties he conducted training courses on the proper use of newly discovered insect and rat poisons such as DDT and compound 1080. He was at one time technical advisor to the exterminating and fumigant board of the New York City Department of Health and was engaged at the World's Fair as a deputy chief of the Health Department. One of his new duties will be to conduct a school in Atlanta for Orkin branch managers and operators at which they will be trained in new techniques of rat and insect extermination. The Orkin Exterminating Co. is now making available to the general public in the southeastern and southwestern states a complete typhus fever control service, including ratproofing and the use of 1080, ANTU, and 10 per cent DDT powder.

Penfield Pennsalt Mgr.

Walker Penfield has recently been appointed manager of manufacturing by Pennsylvania Salt Manufacturing Co., Philadelphia. He was formerly works manager. Claude S. Beldin, regional superintendent, was appointed to the newly created position of production manager.

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Quality Brand

All Grades

Mines
Bishop, Calif.
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70-80 Park Street, Beverly, Mass.

Refinery
Beverly, Mass.

FINE ORGANICS' SPECIAL PRODUCTS

Available in large or small quantities

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CALCIUM BOROGLUCONATE, U. S. Army Spec. Rich source of organic soluble calcium. It is a veterinary medicine for the treatment of Milk Fever.

CALCIUM LEVULINATE. N.N.R. Contains approximately 13% calcium in an injectable form.

CALCIUM IODOBEHENATE, U.S.P.

ALBUMIN TANNATE, U.S.P. XI

TANNOFORM (Methylene Ditannic Acid) and insoluble forms of tannic acid for Diarrhea.

DISINFECTANTS

GERM-I-TOL. A quaternary ammonium compound. For the sterilization of drinking and eating utensils. Recommended for the prevention of molds on leather and citrus fruits and for the elimination of the odors in laboratory animal rooms.

OCTYL RESORCINOL. Phenol coefficient approximately 280. Ready-to-use solution or purified crystals. Compatible with soap.

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Let us compound your formulas for dry alkali mixtures at surprisingly low cost — from a barrel to a carload. Complete stocks of alkalies maintained at our plant. Pulverizing facilities also available.

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Positions Wanted

Chemist, Ph.D.: Research-and production experience in insecticides, waxes and other sanitary products desires executive position with progressive company. Address Box 520, c/o *Soap & Sanitary Chemicals.*

Research Chemist, Ph.D.: Desires new connection with progressive firm. Pacific Coast or New York preferred. Present position with leading manufacturers of lubricants, detergents, sulfonated oils, etc. Address Box 521, c/o *Soap & Sanitary Chemicals.*

Manager: Man with twenty-five years experience managing all phases of sanitary supply manufacturing business, except selling, desires new position with progressive company. Has supervised all purchasing, manufacturing operations, labels, packaging, shipping. Thoroughly familiar with insecticides, disinfectants, soaps, cleaners, waxes, etc. For further details communicate with Box 523, c/o *Soap & Sanitary Chemicals.*

Product Development Chemist: Expert formulation specialties, detergents, waxes, emulsions, cosmetics. Considerable research and production experience. M. S., 28, child, $6000. Address Box 524, c/o *Soap & Sanitary Chemicals.*

Miscellaneous

For Sale: Established small sanitary chemical specialties business with equipment and inventory for sale. Price reasonable, sale for cash only. Located Western Pennsylvania. Opportunity for branch plant. For full details, write to Box 525, c/o *Soap & Sanitary Chemicals.*

Wanted: Automatic or semi-automatic filling, gluing, and sealing packaging machine for pound package free-flowing material. New or used. Immediate delivery. Blue Dew Corp., 1392 Niagara St., Buffalo, N. Y.

Packaging Machinery Wanted Immediately: Will pay cash for Pneumatic Automatic Boxing Machine complete line, 2x6x8, or approximately. C. J. Brocklesby, 702 S. 10th St., Omaha, Nebr.

For Sale: Day Lightning Packer. Skat Co., Hartford 6, Conn.

For Sale: 2—Lehmann 5 Roll Water Cooled Refiners; Ferguson & Haas Automatic Adjustable Soap Wrapping Machine; Jones Type "E" Automatic Toilet Soap Press with conveyors; Shriver, Sperry 12", 18", 24", 30" Iron Filter Presses; etc. Send us your inquiries. BRILL EQUIPMENT COMPANY, 225 W. 34th St., New York City.

Will Purchase Immediately — Pneumatic Packaging Machine, used for chips, powder, cleanser; also dry mixers, chip dryers, crutchers, and automatic soap press. Address Box 526, c/o *Soap & Sanitary Chemicals.*

For Sale: Lehmann type 5 Roll W.C. Steel Roller Mill, 75 horse power motor driven. Stainless Steel Tanks, 100 to 1000 gals. Two Way Soap Cutting Table. Slabber. Soap Frames. Three Roll Water Cooled Mill 16" x 40". Stone Mills; Dryers; Mixers; Grinders; Filter Presses; Kettles & Tanks; Pumps; Ball Bearing Conveyor, etc. Send for our latest Bulletin. We buy your surplus equipment for cash. Stein Equipment Co., 426 Broome Street, New York 13, N. Y.

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(*From Page* 61)

485,021. Published Feb. 5, 1946. Class 4.

420,850. Soap, soap flakes, soap chips and a cleaning preparation in finely divided form. Filed by Fitzpatrick Bros., Inc., Chicago, Aug. 7, 1945. Serial No. 486,855. Published Feb. 5, 1946. Class 4.

420,856. Floor wax. Filed by Acme Wax Co., Fort Worth, Tex., Aug. 22, 1945. Serial No. 487,412. Published Feb. 12, 1946. Class 16.

420,858. Wetting agents. Filed by Nuodex Products Co., Elizabeth, N. J., Aug. 25, 1945. Serial No. 487,570. Published Feb. 19, 1946. Class 6.

420,864. Soap. Filed by New Brunswick Laboratories, Inc., New York, Aug. 29, 1945. Serial No. 487,736. Published Feb. 19, 1946. Class 4.

420,883. Toilet soap. Filed by Primrose House, Inc., New York, Sept. 15, 1945. Serial No. 488,545. Published Feb. 5, 1946. Class 4.

420,886. Liquid emulsion-type floor wax. Filed by Diversey Corp., Chicago, Sept. 17, 1945. Serial No. 488,578. Published Feb. 12, 1946. Class 16.

420,887. Liquid floor cleaning compound. Filed by Hillyard Chemical Co., St. Joseph, Mo., Sept. 17, 1945. Serial No. 488,589. Published Feb. 12, 1946 Class 4.

420,888. Insecticides. Filed by Ade B. Williams, Orlando, Fla., Sept. 17, 1945. Serial No. 488,632. Published Feb. 19, 1946. Class 6.

420,897. Household cleaner and detergent. Filed by Gendron Chemical Co., Los Angeles, Sept. 26, 1945. Serial No. 488,997. Published Feb. 19, 1946. Class 4.

420,898. Soaps, soap pastes, and soap powder. Filed by Roger & Gallet, New York, Sept. 26, 1945. Serial No. 489,013. Published Feb. 19, 1946. Class 4.

421,043. Oil to prevent dust. Filed by Socony-Vacuum Oil Co., New York, Sept. 7, 1945. Serial No. 488,128. Published Feb. 19, 1946. Class 12.

421,166. General household cleaner. Filed by Theobald Industries, Kearny, N. J., Aug. 24, 1945. Serial No. 487,532. Published Feb. 12, 1946. Class 4.

421,309. Hair shampoo. Filed by Frank Von, Los Angeles, May 12, 1945. Serial No. 483,296. Published Feb. 26, 1946. Class 6.

421,315. Shampoo. Filed by Bergholt Laboratories, Minneapolis, June 21, 1945. Serial No. 484,820. Published Feb. 26, 1946. Class 6.

421,316. Coconut oil shampoo. Filed by Bergholt Laboratories, Minneapolis, June 21, 1945. Serial No. 484,823. Published Feb. 26, 1946. Class 6.

421,326. Fur cleaning preparation. Filed by George Zackin, New York, Aug. 4, 1945. Serial No. 486,728. Published Mar. 5, 1946. Class 4.

421,334. Metal cleaner. Filed by Industrial Chemical Products Co., Detroit, Aug. 30, 1945. Serial No. 487,781. Published Mar. 5, 1945. Class 6.

421,335. Metal cleaner. Filed by Industrial Chemical Products Co., Detroit, Aug. 30, 1945. Serial No. 487,782. Published Mar. 5, 1946. Class 6.

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ROACH TEST

(*From Page* 159)

At the 70 per cent mortality level, gamma-benzene hexachloride was the most toxic to German roaches, with pyrethrum a fairly close second. Pyrethrins were the most toxic to American roaches. DDT was second in lethal effect on American roaches and third on German roaches. Sodium fluoride was the least toxic on the basis of micrograms of toxicant per gram of body weight of insect.

Insecticidal and fungicidal compositions contain as an active ingredient an aminated chlorinated kerosene. C. C. Clark, to The Mathieson Alkali Works. Canadian Patent No. 434,209.

LIVESTOCK SPRAYS

(*From Page* 137)

per season for DDT to get an added gain of 50 pounds per head. Because Kansas livestock growers, for the past few years, have been blazing the trail in the use of power in cattle grub and louse control, they now have more than 200 high pressure power sprayers for use in this program. The State of Oklahoma has likewise forged to the front with practically as many high pressure sprayers. The purchase of this amount of equipment in these two large cattle producing states is an accurate gauge of our cattlemen's belief that such treatments pay. Dr. E. W. Larke of the U. S. Bureau of Entomology states that "whenever you can get from 1,202 to 2,306 extra pounds of gains in weights, as we did in the Kansas tests, from the use of only one pound of technical DDT, there is no question of its acceptance and general use."

Informed cattlemen state that, this season, at least one-half of the 2,830,000 beef cattle in Kansas and one-half of the 2,070,000 beef cattle in Oklahoma will be treated with DDT. Fifty pounds additional gain per head on half of these 4,900,000 cattle in Kansas and Oklahoma can mean an extra 122,500,000 pounds in weight, which is equivalent to 73,500,000 additional pounds of beef. What other practice will pay as big dividends and serve hungry humanity as effectively as this DDT fly control program?

Area Fly Control

ELLSWORTH COUNTY, in central Kansas, has made a real start on area hornfly control. The spraying of cattle, barns, sheds and other outbuildings was started in May of 1946 in the center of an area twelve miles square. Every head of cattle in these 144 square miles has been sprayed with 0.25 per cent DDT suspension. The county agent and his cooperators are keeping cattle and farm buildings on the perimeter of this area as free from flies as possible. They reason that, if the first DDT spray was properly applied, few live flies would be left and that spraying the cattle and buildings on the outside edges of the area will prevent reinfestation.

A forward step in cattle fly and louse control has also been taken by the Kansas City Livestock Market. At the Kansas City Stock Yards we are now offering a service of spraying outbound cattle with DDT at a charge of 15c per head, with not to exceed $6.00 per carload. The 10 x 30 foot spray-chamber that accommodates a carload of cattle is equipped with 600 spray nozzles, with one nozzle for each square feet of floor space to provide underline spraying and a like number of nozzles for spraying toplines and sides. Right now, we are treating cattle for the control of flies and lice with 0.25 per cent DDT applied at 500 lbs. pressure. Buyers of replacement cattle will find that in winter months they can go home with cattle properly treated for grubs and lice. We have a feeling of pride in the part our Committee has had in establishing this constructive program and service.

What the Cattleman Wants

IN regard to the controversial question of the use of DDT emulsions by the public, practical investigators for years have questioned the use of oil sprays on cattle and agreed that oil sprays should be used with caution since they are likely to irritate and blister the skin. In Texas, within the past month, two registered bulls and 10 pure bred Brahma cattle died soon after going through a vat charged with 45 gallons of 25 per cent DDT emulsion which had been only slightly stirred. Fifteen other cattle next put through the swim reported "as good as dead" the following day. The neighbor's cattle put through later, when the dip had been thoroughly mixed by other cattle, showed no ill effects. It is reported that the hides of the affected animals were cracked and that analysis showed a high concentration of DDT in the livers. However, in one Kansas test, this year, cattle were dipped in a 0.2 per cent DDT emulsion after the mixture had been thoroughly stirred. No injury in the cattle has been reported.

The fact remains that the most foolproof method of treating cattle with DDT is with the DDT wettable powder in suspension. Manufacturers of DDT oil emulsions will need to educate the public to the proper mixing and use of their products on livestock before they can expect acceptance of their products by livestock growers.

If rotenone-bearing powders continue short this coming season, we shall need a larvicide to take the place of derris and cubs' to control cattle grubs. You already know of the many tests with larvicides for grub control, one of the most promising of which appears to be benzene hexachloride.

Right now, what the livestock industry wants is an insecticide that will effectively and promptly kill stable flies and horse flies on cattle and horses and one which will keep on killing them over a period of at least two weeks. In our own local tests we are trying out BHC, DDT and other members of the DDT group. Some show promise.

The old practice of spraying the dairy cow night and morning with kerosene spray is decidedly on the way out. The livestock industry is looking for a single product that will effectively control all types of flies, lice, ticks and grubs on cattle for comparatively long periods without irritation or injury to the hair coat or animals. A few of your products appear to approach this goal. Naturally, we look to the insecticide industry to develop and perfect livestock insecticides to increase our nation's meat supply and the livestock grower's net income.

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Every effort is made to keep this index free of errors, but no responsibility is assumed for any omissions.

"Quit stallin', Cuthbert! Git ober to Spongoola an' grab dat order!"

Sales resistance . . .

FREQUENTLY, sales resistance develops suddenly and unexpectedly. Out of a clear sky, this has happened in some products during the past month. Regular advertising, however, can help in reducing sales resistance if and when it comes,—advertising done in advance can incite new demand to aid in filling the gaps and can cushion anticipated resistance.

Now if it be in the field of soap products, disinfectants, household insecticides, cleaners, polishes, and other sanitation chemicals, we feel that sales resistance can best be softened up when and if it comes by regular advertising in

SOAP *and Sanitary Chemicals*
254 WEST 31st STREET NEW YORK 1

A.B.C. paid subscription renewal rate for year ending October, 1945—88.4%

Tale Ends

W. L. CRUTCHER of Southern Cotton Oil succeeds McConlogue as chief of the Soap and Glycerine Section, Industrial Oils Division, Fats and Oils Branch, U.S.D.A., says the news. To those industry wits who are already sharpening their needles to give Crutcher a jab, we might state that he is fully conscious of his name, has a tough hide, and a broad sense of humor. They say he is a fast worker, in fact no plodder, likes to mill around, and gets on well with the press. So, any day now, look for a news story herein: "Crutcher interviewed by soap press."

• • •

To Dudley Lum, Givaudan-Delawanna Chicago luminary, goes mention as a record-breaking grandfather. Three grandchildren in three days! And his first grandchildren at that. One Lum daughter had twin girls and three days later, another, a boy. The Lums score again! And for you, Grandpa Lum, congratulations!

• • •

Some exterminators report that their bedbug work has fallen off more than half as a result of the use of DDT over the past year. Rather startling news! Imagine your service being so good that you are in a fair way to put yourself out of business!

• • •

Soya bean oil is being diverted from food uses to the paint trade on account of a scarcity of linseed oil, says the news. May we also recommend to the paint trade that they look into the possibilities of this imitation scotch whiskey, the so-called domestic scotch-type, in the varnish kettle from whence it apparently first came.

• • •

When cigarettes were scarce, they were kept under the counter. But, soap flakes are kept in the back room to find their way quietly and mysteriously into the grocery orders of XXX gilt-edge customers only!